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Investigating the Relationship between Emotional Intelligence and Cultural Intelligence to
Attitudes towards Team-Based Learning in Undergraduate Pre-health Profession Students

A dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of
Philosophy at Virginia Commonwealth University.

by

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Dedication

To my Wife, *my Lena*, where would I be without you, *how* could I be without you. 

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...but for the grace of God!

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Abstract

INVESTIGATING THE RELATIONSHIP BETWEEN EMOTIONAL INTELLIGENCE AND CULTURAL INTELLIGENCE TO ATTITUDES TOWARDS TEAM-BASED LEARNING IN UNDERGRADUATE PRE-HEALTH PROFESSION STUDENTS

By Kevin A. Harris, Doctoral Candidate

A dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy at Virginia Commonwealth University.

Virginia Commonwealth University, 2017.

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Improving patient outcomes has long been the rationale supporting calls to reform health care delivery systems and health profession education programs (Greiner, 2002; Institutes of Medicine, 2001, 2004; O'Neil & Pew Health Professions Commission, 1998). A common aim sought through recent healthcare reforms is greater patient-centered delivery of care. In 2003, the Institute of Medicine shared its vision statement for health professions education, asserting that "[a]ll health professionals should be educated to deliver patient-centered care as members of an interdisciplinary team, emphasizing evidence-based practice, quality improvement approaches and informatics" (Knebel & Greiner, 2003, p. 3). The importance of including team-based learning pedagogy in health profession education is viewed as critical to students' preparation for challenges they will confront in their professional careers (Sibley & Parmelee, 2008).

Despite the importance placed on teamwork in health sciences education, little attention has been devoted to understanding underlying factors influencing health sciences student attitudes towards learning in a team-based environment (Curran, Sharpe, Forristall, & Flynn, 2008). Moreover, there is less understanding of factors that influence attitudes towards team-based learning in pre-health students who are pursuing admission into a health profession program (Dumke, VanderWielen, Harris, & Ford-Smith, 2016). The purpose of this study is to explore the importance of specific non-academic factors, emotional intelligence and cultural intelligence, in shaping undergraduate pre-health students' attitudes towards team-based learning.

A quantitative, non-experimental, cross-sectional study design was used in this study employing correlational and multivariate regression analysis techniques. Findings indicate: a) significant relationships between emotional intelligence and cultural intelligence to the value students place on working in groups; and, b) emotional intelligence accounts for approximately 3% of variance above and beyond the Big Five personality factors in predicting student attitudes towards group work.

This study has the potential to inform the development of interprofessional education policy and practice in two fundamental ways. First, the study provides insight on the importance of emotional and social competence in shaping students' attitudes towards team-based learning. Secondly, increasing the understanding of emotional intelligence and cultural intelligence in the pre-health stage of a student's development can influence the preparation of pre-health students for admissions to health professions programs.

CHAPTER 1. INTRODUCTION

Background

Improving patient outcomes has long been the rationale supporting calls to reform health care delivery systems and health profession education programs (O’Neil & Pew Health Professions Commission, 1998; Greiner, 2002; Institutes of Medicine, 2001, 2004). The Institute for Healthcare Improvement proposed a set of systems-level goals that focus on improving the experiences of patients, the health of populations, and reducing the costs associated with care. These goals were defined as the “Triple Aim” (Berwick, Nolan, & Whittington, 2008, p.760). The Triple Aim framework is viewed as a mechanism to improve performance across the health system enterprise (Berwick, Nolan, & Whittington, 2008) and as a catalyst in helping to bridge the gap between education and practice (Brandt, 2014). The Triple Aim framework has recently been recast as the Quadruple Aim (Bodenheimer & Sinsky, 2014). The Quadruple Aim framework includes a focus on the health and well-being of healthcare providers to address issues of burnout associated, ironically, with added pressures on providers related to implementing Triple Aim objectives (Bodenheimer & Sinsky, 2014).

A common aim sought through recent healthcare reforms is greater patient-centered delivery of care. Patient-centeredness is facilitated when patients perceive that their health care team is diverse, respects, and cares about their differences, values, preferences, and expressed needs (Sullivan, 2004). In 2003, the Institute of Medicine shared its vision statement for health professions education, asserting that “[a]ll health professionals should be educated to deliver

patient-centered care as members of an interdisciplinary team, emphasizing evidence-based practice, quality improvement approaches and informatics” (Knebel & Greiner, 2003, p. 3).

The importance of including team-based learning pedagogy in health profession education is viewed as critical to students’ preparation for challenges they will confront in their professional careers (Sibley & Parmelee, 2008). However, health profession education programs have struggled to prepare students to function in teams at optimal levels (Michaelsen, Parmelee, McMahon, & Levine, 2008). Two overarching structures have driven much of the resistance. The first is the role that institutional factors play in creating barriers to transitioning the health education enterprise towards more team-based learning approaches. Barriers created by institutional factors include the high costs associated with updating and revamping curricula, undervaluing the impact of cultural diversity (e.g. race/ethnicity, linguistic, gender) (Gilbert, 2005), silos and hierarchy within and across education units, established curricular structures, and faculty buy-in or knowledge of interprofessional education (Olenick, Allen, & Smego, 2010).

The profound impact of professional identity¹ represents an even more resistant factor contributing to the slow embrace of team-based approaches in health professions education. There are arguments that suggest there are ethical and practical reasons to support the usefulness of a professional identity in students and practitioners. For example, a sufficient level of professional identity is thought to foster an in-depth understanding of the clinical and professional expectations of a given profession (Monrouxe, 2010). The general consensus, however, suggests the influence of professional identity poses barriers to the extent that it

¹ “A process of socialization within professional role development” (Carlisle, Cooper, & Watkins, 2004)

impedes student engagement in team-based learning situations (Parsell and Bligh, 1999; McNair, 2005; Pecukonis, Doyle, & Bliss, 2008; Hamilton, 2011; Mitchell, Parker, & Giles, 2011).

Professional identity in a health professions context, some claim, resembles a form of “tribalism” (Carlisle, Cooper, & Watkins, 2004, p.548). The tribalism effect is exacerbated as students are often trained in silos that are competitive, discipline-centric education programs (VanderWielen et al., 2014). The combination of institutional factors and professional identity creates a central challenge to those seeking increased levels of teamwork in healthcare to break through the impediments and to arrive at effective teamwork among health profession students (Payler, Meyer, & Humphris, 2008).

The operative phrase in the quest for improved health outcomes is *healthcare team*. D’Amour and Oandasan (2005) place the discussion regarding healthcare teams in the broader context of interprofessionality, “defined as the development of a cohesive practice between professionals from different disciplines” (p. 9). Interprofessionality also addresses important factors and practices in the education sphere, referred to as “interprofessional education” (D’Amour & Oandasan, 2005, p. 10). The next two sections discuss important contexts for creating a more team-centered health profession workforce: interprofessional education and pre-health profession advising.

Interprofessional Education

Interprofessional education emerged in a global context over a century ago. Interprofessional education was offered as a method of addressing expanding patient needs through collaboration between the fields of medicine and social work (Schmitt, Gilbert, Brandt, & Weinstein, 2013). The United States and Canada have been positioned as leaders in interprofessional education based on the seminal work by a team of researchers in the early

1970's led by John F. McCreary, MD, representing Canada, and DeWitt Baldwin Jr., MD, from the United States (Schmitt et al., 2013). The intent of interprofessional education has not been to establish a new profession, instead, it has been to encourage and structure the integration of existing professions (D'Amour & Oandasan, 2005). The primary aim of interprofessional education has been to better equip health profession students to navigate complex and interdependent education and clinical environments (Cooper, Braye, & Geyer, 2004). A commonly accepted definition of interprofessional education is “when students from two or more professions learn about, from, and with each other to enable effective collaboration and improve health outcomes” (Interprofessional Education Collaborative, 2011, p. 2). Evidence suggests that students who experience interprofessional learning are more inclined to work collaboratively on health care teams and to demonstrate openness and respect for the contributions of other team members (Cerra & Brandt, 2011).

The evolution of interprofessional education in North America was launched through a series of reports from the Institutes of Medicine (Schmitt et al., 2013). These reports were included under the moniker of the *Quality Chasm* (Schmitt et al., 2013, p. 284), and highlighted concerns with patient safety. A remedy offered by the reports included instilling principles of teamwork among practitioners in the healthcare industry (Schmitt et al., 2013). Organizations such as the World Health Organization (WHO) have helped to codify elements of the Institutes of Medicine reports and related conference proceedings into frameworks that have shaped the path for interprofessional education (Oandasan & Reeves, 2005).

The WHO (2010), “Framework for Action on Interprofessional Education and Collaborative Practice” (Framework): provides an analysis of the current global landscape for interprofessional education and practice; identifies strategies that foster greater teamwork and

collaboration among health professionals; and, provides a series of recommendations for policy makers that are adaptable for their local situations. The Framework also discusses specific principles that should inform the development of interprofessional education programs to include: utilizing adult learning principles and pedagogy; linking student education experiences to their “real world experiences” (World Health Organization, 2010, p.24); and fostering ongoing formal and informal interactions among students (World Health Organization, 2010). The Framework’s underlying premise is “...[o]nce students understand how to work interprofessionally, they are ready to enter the workplace as a member of the collaborative team” (World Health Organization, 2010, p.11).

Another prominent organization in the interprofessional space is the Interprofessional Education Collaborative (IPEC). IPEC was formed in 2009 and currently consists of 15 national health education associations² (Interprofessional Education Collaborative, 2016). The original focus of IPEC was on,

“...developing a common vision for how the respective professions could combine their unique abilities to deliver patient-centered team-based care, promote efforts to reform health care delivery and financing in line with that vision, and foster meaningful interprofessional learning experiences to support team-based care of the future” (Interprofessional Education Collaborative, 2011, p.45)

IPEC developed a competency-based interprofessional education model patterned after the World Health Organization and the Canadian Interprofessional Health Collaboration (Dow, DiazGranados, Mazmanian, & Retchin, 2014). The four core competency domains disseminated in 2011 included: (a) values and ethics for interprofessional practice, which endeavors to create a

² Note: The following six health profession organizations collaborated to form IPEC in 2009: American Association of Colleges of Nursing; American Association of Colleges of Osteopathic Medicine; American Association of Colleges of Pharmacy; American Dental Education Association; Association of American Medical Colleges; and, Association of Schools of Public Health. (Interprofessional Education Collaborative, 2011, p.45)

sense of professional identity within students; (b) roles and responsibilities, which seeks to enhance the understanding and appreciation of the contributions and responsibilities of each profession represented on health care teams; (c) interprofessional communication, which fosters the readiness of students to work effectively on health care teams; and (d) teams and teamwork, which equips students to function operationally and attitudinally in the best interest of the team and ultimately the patient. The core competencies serve as guidelines that are to be adapted to meet the specific needs of respective health profession institutions (Interprofessional Education Collaborative, 2011).

The IPEC framework serves as a leading framework advancing the interprofessional education project. Updates to the IPEC framework were released in 2016 essentially reorganizing the four separate competency domains under a unified domain labeled “Interprofessional Collaboration” (Interprofessional Education Collaboration, 2016, p. 1). The revisions also included an expansion of the competencies to better align with the Triple Aim framework with particular focus on the population health component (Interprofessional Education Collaborative, 2016).

The IPEC framework has been endorsed by stakeholder organizations such as the Health Resources and Services Administration and major private foundations (Cerra and Brandt, 2011). For example, the National Center for Interprofessional Practice and Education (NCIPE) has proposed integrating the aims of interprofessional education to the transformative goals reflected in the Triple Aim (Brandt, 2014). In particular, this proposed relationship is referred to as the “Nexus” (Brandt, 2014, p.5) and expected to strengthen the evidentiary basis for interprofessional education and collaborative practice, inform the development of collaborative practice models, strengthen the business case for collaborative models, and buttress the research

infrastructure towards development of national models for training in interprofessional settings (Brandt, 2014).

The implementation of interprofessional education in health sciences programs provides an important vehicle for the development of teamwork and collaboration skills. However, prior to entering a health profession program, many students experience an important support phase of their preparation during which knowledge, skills, and attitudes are formed. This phase of development is often guided by professionals who serve as pre-health profession advisors.

Pre-health Profession Advising

Preparation for a health career is a daunting task. Students who choose to pursue a career in the health professions must first wade through a myriad of career options (Johnson, Settimi, & Rogers, 2001). Further, entry into a health profession school requires establishing a competitive profile including solid performance in both academic and experiential areas (Johnson, Settimi, & Rogers, 2001). In addition, many health profession schools require students to perform well on national standardized tests such as the Medical College Admissions Test or the Dental Admissions Test. Success in each of these performance areas is still no guarantee, as many health profession schools receive a significantly greater number of applications than seats available in a given class. For example, according to data provided by the Association of American Medical Colleges for 2015-2016, there were 52,536³ total applications received for admission with 20,631⁴ entering matriculants. The complicated and challenging journey for students pursuing a health professions career exposes the need for well-informed pre-health advisors to provide necessary guidance and resources (Oyewole, 2001; Bertolami, 2007;).

³ Source: Association of American Medical Colleges. <https://www.aamc.org/download/321472/data/factstablea8.pdf>

⁴ Source: Association of American Medical Colleges. <https://www.aamc.org/download/321474/data/factstablea9.pdf>

The contours of pre-health advising are shaped at the national level by the National Association of Advisors for the Health Professions (NAAHP). The NAAHP is the only national organization that provides training and professional development, resources, and information on behalf of pre-health advisors. Although the pre-health professions benefit from having a national voice, the form and function of pre-health advising offices vary greatly across institutions. The ability of pre-health advising offices to provide sound advice and resources to students is reflective of the level of support and commitment of institutional leadership (Oyewole, 2001). In many instances, pre-health advisors are employed in a unit dedicated to preparing students for admission to a health profession school. In other instances, the responsibility of pre-health advising is assigned to a faculty member who typically has a science background. The variation in the structure and function of pre-health offices is also influenced greatly by the degree of technology available to both advisors and students, as the interest in pre-health careers at some institutions is overwhelming, particularly for offices with limited staffing (Oyewole, 2001).

In a broader sense, student advising is trending towards more personalized advising strategies to address the increasingly diverse social, cultural, and academic needs of students (Steingass & Sykes, 2008), and towards improving student achievement in areas such as retention and graduation (Young-Jones, Burt, Dixon, & Hawthorne, 2013). Pre-health advising staff work within this broader context and contribute to the preparation of students helping insure competitiveness as they seek admissions to a health sciences program (Oyewole, 2001). In this respect, pre-health advisors are expected to stay informed of resources on and off their campuses that can help the students they serve (Oyewole, 2001). A primary function of pre-health advisors is to provide reference letters to health sciences schools on behalf of students (Oyewole, 2001).

Other services and resources to assist students include, but are not limited to (Johnson et al., 2001):

- reviewing and critiquing student academic and experiential profiles;
- providing workshops and seminars to strengthen academic and experiential profiles;
- providing students with test preparation information or workshops;
- providing information on campus and external support resources;
- serving as a clearinghouse for student experiential activities; and
- connecting students with mentoring opportunities or serving as mentors.

Pre-health advisors are also seen as a critical partner in helping to prepare a healthcare workforce that is reflective of the populations served (Harris, 2005; Oyewole, 2001). Pre-health advisors are also often asked to address issues such as diversity and cultural competence in their preparation of students (Oyewole, 2001; Thind, Hewlett, & Andersen, 2009; Price & Grant-Mills, 2010; Wall et al., 2015). The many offices on college campuses across the United States provide opportunities to expose students to the plethora of health career options and to prepare students for important trends in health education, such as interprofessional education.

In summary, transformations of the current U.S. health system are in motion to address a myriad of ills. Patients are too often experiencing less than optimal service from providers that are equally frustrated by their limitations (Berwick, Nolan, & Whittington, 2008). The resurgence of interests to train the future healthcare workforce to value and practice teamwork is proposed as an important part of an array of solutions. Health profession programs across the United States are endeavoring to answer this call through the implementation of interprofessional education programs that pursue connecting the education process to advancements in patient care (Dow, DiazGranados, Mazmanian, & Retchin, 2014).

Figure 1 shows the reality that the pathway towards training individuals to become healthcare providers is complex and relies on interdependent relationships among various stakeholders. That complexity is multiplied as emerging trends in health professions education and healthcare practice is introduced within the continuum. The myriad of forces that confront the healthcare arena intensifies the need for new approaches that innovates how we train the future health professions workforce (Brandt, 2014).

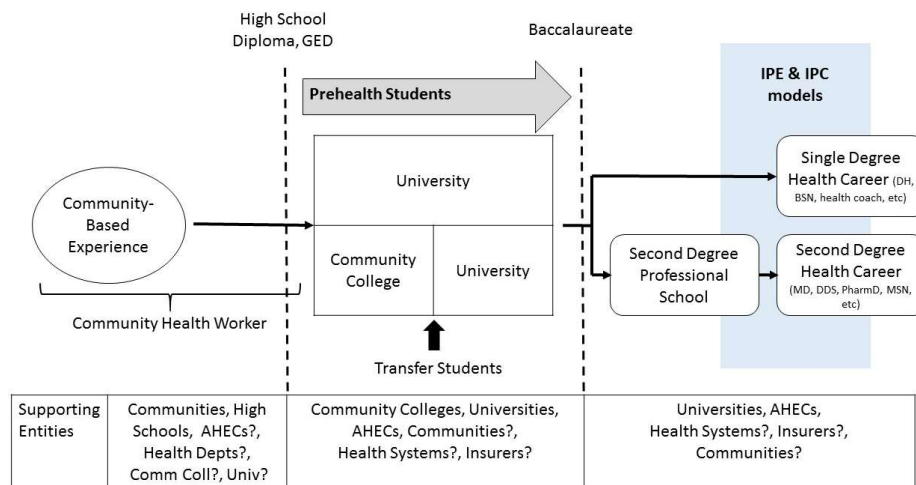


Figure 1: Health Professions Education Pipeline to Practice Ecosystem. Adapted from a health professions pipeline conceptual model developed by Alan Dow, M.D., M.S.H.A., Assistant Vice President, Interprofessional Education and Collaborative Care, Professor, Internal Medicine, Virginia Commonwealth University. (Unpublished). Permission Granted.

Note. AHEC = Area Health Education Centers; IPE = Interprofessional Education; IPC = Interprofessional Care; BSN – Bachelor of Science in Nursing; MD – Doctor of Medicine; DDS = Doctor of Dental Surgery; PharmD = Doctor of Pharmacy; MSN = Master of Science in Nursing.

The collaborative work of various stakeholders within the healthcare arena such as IPEC and the NAAHP is vital to advancing the work necessary to produce a diverse, well-prepared cadre of future health professionals. Such a workforce may then answer the call for more teamwork and collaboration in health care delivery to improve patient outcomes (Greer & Clay, 2010).

Statement of the Problem

Teamwork is integral to the implementation of effective interprofessional education programs but is inherently challenging. Higher education institutions present a particular set of barriers that can impede the success of an interprofessional education program. Gilbert (2005) suggests there are structural barriers at the institutional level that include (a) inconsistent use of language in terms of how we describe, interpret, and evaluate interprofessional programs (e.g., interdisciplinary education); (b) issues with embracing and adapting to change from an organizational perspective; (c) constraints imposed based on economic or legislative realities; and (d) resistance by key stakeholders (e.g., faculty) that can hinder the quantity and quality of the interprofessional experiences.

As if overcoming institutional factors is not daunting enough, students arrive with preconceived notions of their profession and often mistaken notions of other professions (Parsell & Bligh, 1999). This creates an immediate challenge for interprofessional programs to re-engineer those perceptions. Despite the importance placed on teamwork in health sciences education, little attention has been devoted to understanding underlying factors influencing health sciences student attitudes towards learning in a team-based environment (Curran, Sharpe, Forristall, & Flynn, 2008). Moreover, there is less understanding of factors that influence attitudes towards team-based learning in pre-health students who are pursuing admission into a health profession program (Dumke, VanderWielen, Harris, & Ford-Smith, 2016). This knowledge deficiency exists in spite of evidence that the formation of attitudes and behaviors in the very early stages of a student's development greatly influences biases held towards other health profession disciplines (Olenick et al., 2011). This bias creates barriers to effective teamwork in the learning and practice environment (Parsell & Bligh, 1999).

Considering the significant constraints imposed institutionally and challenges presented by student attitudes and perceptions, there is a legitimate argument for an intense effort to introduce students to principles of teamwork earlier in their educational experience. Likewise, the benefits of earlier exposure can be advanced by also understanding factors that foster positive attitudes and behaviors among students in the formative stages of their education and certainly prior to their entry into interprofessional educational settings. What is understood is the current strategy of emphasizing teamwork at the point students enter health profession programs presents challenges and can be equated to “. . .shutting the door after the horse has bolted” (Carlisle, Cooper, & Watkins, 2004, p. 545). This study is designed to inform stakeholders on how they can potentially shut the door, *sooner*.

Purpose of the Study

The purpose of this study is to explore the importance of specific non-academic factors, emotional intelligence and cultural intelligence, in shaping undergraduate pre-health students' attitudes towards team-based learning. Team-based learning has gained broad appeal within health professions education and, when implemented properly, requires students to effectively navigate learning environments such as interprofessional education that are structured on peer interactions (Michaelsen et al. 2008). Emotional intelligence and cultural intelligence are related social cognitive factors (Earley & Mosakowski, 2004) and were chosen as variables of interest based on growing research supporting their influence on individuals' performance in learning situations featuring a high degree of peer interactions (Earley & Ang, 2003; Parker, Summerfeldt, Hogan, & Majeski, 2004; Crowne, 2009; Clarke, 2010a). Research also demonstrates that emotional intelligence (Emmerling & Boyatzis, 2008) and cultural intelligence (Earley & Ang, 2003; MacNab & Worthley, 2012) influence cross-cultural interactions that are

encouraged in team-based learning settings (Michaelsen & Sweet, 2008). For example, further examination of emotional intelligence and cultural intelligence in relation to team-based learning can inform how teams are formed and what combinations of these qualities are most important to distribute among teams. Another consideration is the importance of understanding ways in which cultural intelligence influences the dynamics within a group, particularly from a cross-cultural interactive perspective.

Overall, the findings of the study expand current research on the role of non-cognitive factors in influencing students' performance in team-based learning settings. The findings also inform how students can be prepared for team-based learning experiences prior to enrollment in health profession programs.

Significance of the Study

The results of this study have the potential to inform the development of interprofessional education policy and practice in two fundamental ways. First, proponents of interprofessional education in the healthcare industry and the public service sector recognize the need for future health professionals to possess a well-rounded set of skills that include emotional and social competence (Parker et al., 2004). Although there is research on the role of emotional intelligence in team-based learning, available studies focus on increasing emotional intelligence as a result of participation in team-based learning activities (Clarke, 2010a). The current study also provides insight on the roles that emotional and social competence skills play in shaping students' attitudes towards team-based learning. This knowledge, discovered early, can then be leveraged in later stages of the students' educational experiences. This could, in many ways, relieve some of the pressure on solely addressing the issue of teamwork in the interprofessional

education curriculum, or can possibly accelerate the benefits of team-building interventions (Parker et al., 2004).

Secondly, it is already recognized that there is merit to introducing interprofessional education in earlier stages of students' educational development (Hoffman & Harnish, 2007). However, research to date focuses largely on interprofessional education among enrolled health profession students (Crossley & Vivekananda-Schmidt, 2009; Mitchell et al., 2011). Increasing the understanding of emotional intelligence and cultural intelligence in the pre-health stage of a student's development can influence the preparation of students as they pursue admissions to a health professions program.

Research Questions

The relationships among these variables are examined in this study using the following research questions.

1. What is the relationship between emotional intelligence and attitudes towards team-based learning among undergraduate pre-health profession students?
2. What is the relationship between cultural intelligence and attitudes towards team-based learning among undergraduate pre-health profession students?
3. What degree of variance in attitudes towards team-based learning is predicted by emotional intelligence and cultural intelligence, above and beyond the Big Five⁵ personality factors?

Organization of the Study

This study consists of five chapters. The first chapter provides an introduction and positions the context of the study within the emergence of interprofessional education in the

⁵ A detailed description of the Big Five personality factors is presented on page 68.

health sciences. Chapter two presents a review of relevant literature on team-based learning, emotional, and cultural intelligence. In addition, this chapter examines the role of select demographic variables and personality traits with respect to the aforementioned concepts. Chapter three entails a description of the methodology, data collection procedures, and steps used in conducting analysis. This chapter also discusses the Institutional Review Board considerations. Details of the results of the analysis for this study are presented in chapter four. Finally, chapter five addresses the limitations of the study, policy and practical implications, as well as offering recommendations and opportunities for future research.

CHAPTER 2. REVIEW OF THE LITERATURE

Increased collaboration among health care practitioners is considered a critical need in providing quality care to an increasingly diverse patient population (Heinemann and Zeiss, 2002). Success is dependent on the preparation of a health care workforce that can work effectively in teams across various health profession disciplines (Baker, 2010). Interprofessional education is seen as a vehicle to improve students' knowledge, skills, and attitudes with respect to teamwork as foundational to those students ultimately functioning as members of a healthcare team (Payler, Meyer, & Humphris, 2008). This chapter explores underlying concepts pertinent to the relevance of teamwork in the health professions and is organized into the following major areas: (a) methods for review of the literature; (b) theoretical context; (c) team-based learning; (d) emotional intelligence; (e) cultural intelligence; and, (f) the intersections of emotional intelligence, cultural intelligence, and team-based learning.

Methods for Review of the Literature

A systematic review of the literature was conducted using multiple forms of electronic databases and print material. Google Scholar[®] was the primary search tool used for locating related literature. Overarching search terms included: interprofessional education; team-based learning; team-based learning in the health professions; emotional intelligence; emotional intelligence in the health professions; cultural intelligence; cultural intelligence in higher education; and cultural intelligence in the health professions. PubMed[®] was used specifically to explore health sciences research focused on attitudes towards team-based learning.

PsycARTICLES® was used to further explore the emotional intelligence and personality literature. Research articles were reviewed and accepted based on meeting the Standards for Reporting on Empirical Social Science Research in AERA Publication (Duran et al., 2006). Emphasis was placed on relevant, peer-reviewed articles that were published from the year 2000 to current.

Theoretical and Conceptual Frameworks

Theoretical Framework

The theoretical framework guiding this study is social intelligence theory. Social intelligence theory was introduced by E.L. Thorndike in the 1920's and defined as "the ability to understand and manage men and women, boys and girls – to act wisely in human relations" (E. Thorndike 1920, p. 228). Robert Thorndike and Saul Stein (1937) provided a revised definition stated as "the ability to manage people" (p. 275). Social intelligence is included within Howard Gardner's theory of multiple intelligence (Kihlstrom & Cantor, 2000). Gardner (2006) introduced multiple intelligence theory in 1983 as a culmination of research he began over a decade prior. Gardner (2011) developed the theory in response to then prevailing definitions of intelligence as a singular quality humans possess in varying degrees that can be measured definitively by a test. Instead, multiple intelligence theory asserts that there are several distinct forms of intelligence that can be impacted by educational and cultural experiences (Gardner, 2006). Gardner (2006) originally offered seven forms of intelligence to include musical intelligence (p. 8), bodily kinesthetic intelligence (p. 9), logical-mathematical intelligence (p. 11), linguistic intelligence (p. 13), spatial intelligence (p. 13), interpersonal intelligence (p. 14), and intrapersonal intelligence (p.14).

Social intelligence is positioned within the interpersonal and intrapersonal dimensions of multiple intelligence theory (Kihlstrom & Cantor, 2000) and “involves skills related to all social interactions” (Crowne, 2009). Social intelligence enhances an individual’s capacity to adapt to social situations while also invoking positive behaviors in others (Kaukianen et al., 1999). The benefit of having a high degree of social intelligence extends particularly to crisis situations (Goleman & Boyatzis, 2008). Social intelligence differs from cognitive intelligence since cognitive intelligence is interpreted in terms of the quantity of intelligence an individual possesses, whereas social intelligence focuses on what *types* intelligence are present (Kihlstrom & Cantor, 2000).

Conceptual Framework

Social intelligence is positioned as an overarching construct that includes emotional and cultural intelligence as related sub-constructs (Crowne, 2007, 2009). Crowne’s (2007) research provides foundational work examining the relationship among social, emotional, and cultural intelligence constructs from a theoretical perspective. The underlying assertion is that having higher levels of emotional and cultural intelligence results in a higher level of social intelligence. “Cultural intelligence is related to emotional intelligence, but picks up where emotional intelligence leaves off” (Earley & Mosakowski, 2004, p. 1). Cultural intelligence differs in that it specifically focuses on the intercultural aspects of group interaction, whereas emotional intelligence is viewed primarily as an interpersonal attribute (Ang, Rockstuhl, & Tan., 2015). Therefore, individuals who exhibit high emotional intelligence do not necessarily function well in intercultural contexts (Ang et al., 2015). However, both cultural intelligence and emotional intelligence rely on the ability of an individual to “suspend judgment—to think before acting” (Earley & Mosakowski, 2004, p. 2). The two concepts have been shown in research to function

in a complementary fashion in areas including leadership development (Rockstuhl et al, 2011), management training and development (Crowne, 2013, Moon, 2010), and in the development of students to adapt to cross-cultural environments (Crowne, 2013). Drawing from the social intelligence theoretical lens, and the work by Crowne (2007, 2009), the current study's research questions and hypotheses will be guided by the conceptual framework reflected in Figure 2.

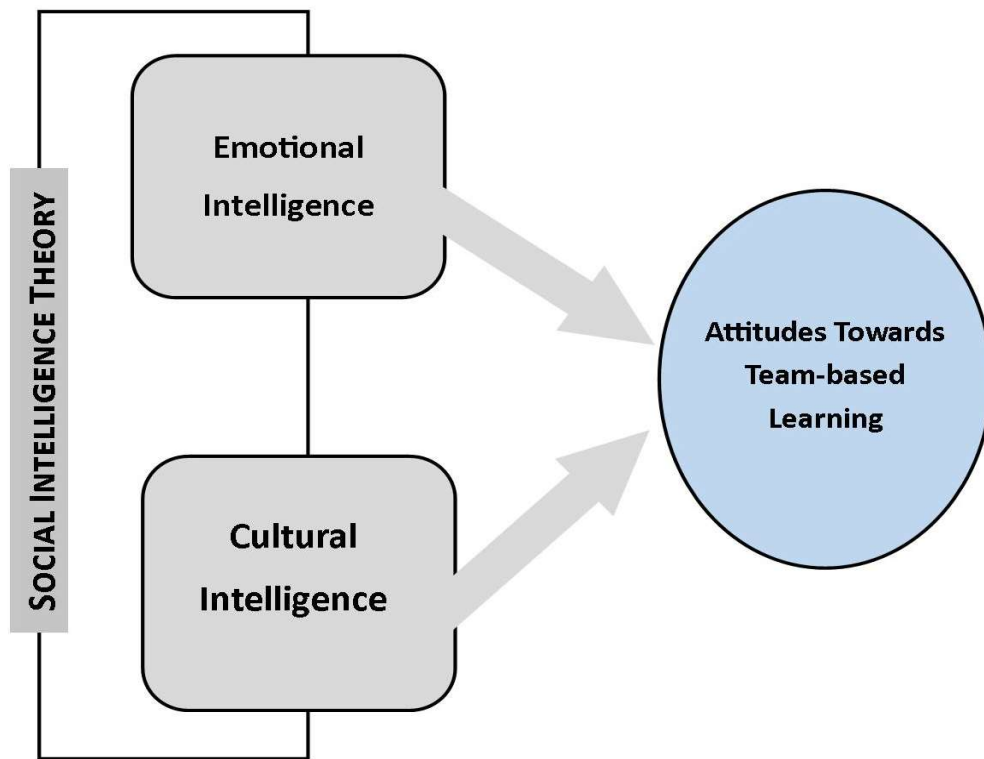


Figure 2. Conceptual framework for examination of emotional intelligence, cultural intelligence, and team-based learning.

Researchers are encouraged to examine emotional intelligence, cultural intelligence, and social intelligence together, particularly in studying interactions in group or team settings (Crowne, 2009). Analysis that omits one of the concepts may lead to a misinterpretation of study results as the concepts may have mediating or moderating influences on one another (Crowne, 2009). The next section introduces the concept of team-based learning.

Team-Based Learning

Societal demands are compelling higher education institutions to prepare students for team learning. The ability of students to learn in team-based settings helps to prepare them for their health profession careers (Smart & Csapo, 2003). Team-based learning has proven particularly useful in interdisciplinary health profession settings in terms of enhancing training related to improving patient safety and collaborative decision-making (Parmelee & Hudes, 2012).

Health profession students are accustomed to learning with each other but less accustomed to learning from or about each other (Sargeant, 2009). Interprofessional education programs employ a range of approaches that vary in length, depth, and educational approach (Payler, Meyer, & Humphris, 2008). Research suggests that programs offer a range of options to include no direct interventions focused on interprofessional education to structured team-based models (Cook, 2005). In all, the approaches are also intended to bridge the gaps between educational outcomes and practice outcomes (Abu-Rish et al., 2012).

The following sections introduce prominent educational frameworks that are incorporated into interprofessional education programs to build student teamwork skills and abilities. The sections conclude with a discussion of the application of team-based learning within the health sciences and includes a review of its implications within a pre-health profession education context.

Overview of Prominent Team-Based Learning Pedagogies

Although there has been a resurgence of interest in interprofessional education in recent decades, less attention has been devoted to examining the pedagogical approaches that are employed (Payler, Meyer, & Humphris, 2008). These approaches vary and implementation is

affected by the context, personnel, and make-up of the students involved (Stew, 2005). Abu-Rish et al. (2012) conducted a comprehensive literature review to create a profile of educational strategies used in interprofessional programs and to offer recommendations for enhancing the implementation of programs in the future. The study found approximately 58% of programs used small group discussion formats; 48% used problem-based learning⁶; 36% used large group lectures. Other strategies included patient simulation, patient interaction in clinical settings, reflective methods, and community-focused activities (Abu-Rish et al., 2012).

An emerging, innovative pedagogical approach utilizes technology as a platform for health profession students from multiple disciplines to work collaboratively. The advent of this approach aligns with the current trajectory of health professions education and healthcare practice towards “virtual teams” (Dow et al, 2016, p.120). Virtual teams utilize technology to permit health profession practitioners positioned in various locations to collaborate in a patient care delivery setting (Dow et al, 2016). Likewise, the virtual team model has been introduced in the interprofessional education arena utilizing Web-based technology to permit health profession students from multiple disciplines to co-learn and foster teamwork through on-line discussion of a geriatric patient case (Dow et al, 2016). The virtual team system is designed to assess and develop student interprofessional competencies as defined by IPEC (Dow et al, 2016). Early indications support the use of the virtual teams system as a viable means of assessing student individual and team performance in a Web-based environment, while addressing a key logistical challenge faced by interprofessional programs of having to locate students from multiple disciplines.

⁶ Problem-based learning is “an instructional method that initiates students’ learning by creating a need to solve an authentic problem” (p.486). Source: Hung, W., Jonassen, D. H., & Liu, R. (2008). Problem-based learning. *Handbook of research on educational communications and technology*, 3, 485-506.

The general pedagogical thrust of interprofessional education programs is to encourage collaborative models of learning. Collaborative learning is characterized by the use of small groups of individuals for instructional purposes with the intent of having mutual learning benefits experienced both individually and collectively (Wang & Burton, 2010). Collaborative learning has roots in social constructivist learning theory as developed by scholars such as Piaget and Vygotsky (Wang & Burton, 2010; Alzahrani & Woolard, 2013) and John Dewey (Alzahrani & Woolard, 2013). Specifically, social constructivist learning theory intersects with collaborative learning in areas such as the teacher's role in classroom settings, learner-learner interactions, and the methods and styles of learning by group members (Alzahrani & Woolard, 2013).

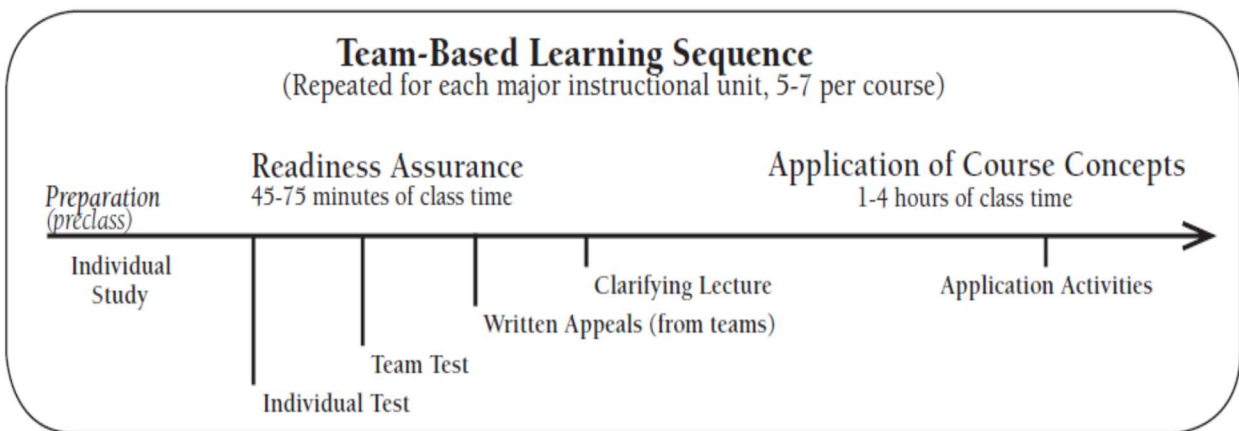
Sargeant (2009), asserts that interprofessional education involves new ways of learning with emphasis on the social and environmental context. Health profession students are accustomed to learning with each other but less accustomed to learning from each other or about each other (Sargeant, 2009). The concept of collaborative learning encompasses many of the dynamics associated with interprofessional education and has received increased attention within the latter phases of the 20th century (Wang & Burton, 2010).

An Overarching Framework for Team-based Learning

A widely-referenced model of team-based learning was developed by Larry Michaelsen in the 1970s as a method for teaching business students (Hrynychak & Batty, 2012). Team-based learning falls under constructivist learning theory that asserts “knowledge is viewed as a process that is structured by personal experiences” (Hrynychak & Batty, 2012, p. 797). Team-based learning also has kinship with the concept of cooperative learning⁷; however, in team-based learning students play a more active role in managing and evaluating team performance

⁷ Cooperative learning is a formal and informal student learning model where students work together toward completion of a specific project or assignment in a temporary or *ad hoc* fashion (Johnson & Johnson, 1999).

(Michaelsen, Knight, & Fink, 2002). There are four important elements of Michaelsen’s team-based learning model that guide its implementation. Elements of the model include: formation and management of groups, accountability, feedback, and assignment design (Michaelsen & Sweet, 2008). As graphically reflected in Figure 3, team-based learning is focused on the acquisition and application of knowledge using a multifaceted instructional format that consists of pre-course assignments, readiness assessment exercises in individual and group formats, and an application phase (Michaelsen & Sweet, 2008). Inherent in the model is an ongoing feedback mechanism provided by faculty (Michaelsen & Sweet, 2008) and fellow student members of the group (Michaelsen & Sweet, 2011).



*Figure 3. Conceptual model reflecting a classic team-based learning process. Adapted from “Team-Based Learning,” L. K. Michaelsen and M. Sweet, 2011, *New Directions for Teaching and Learning*, 128, p. 41-51.*

Team-based learning requires a significant restructuring of traditional lecture-based course designs (Michaelsen & Sweet, 2008). A stark departure of team-based learning models from traditional models is the development of self-managed student learning teams (Parmelee & Michaelsen, 2010) that are characterized by “active learning within [the] groups of students” (Mody, Kiley, Gawron, Garcia, & Hammond, 2013, p. 239). This does not diminish the role or

importance of faculty in any sense. Successful implementation requires that sufficient attention be given by faculty to operational components such as 1) diligence to envisioning the critical instructional objectives desired within the context of what is considered satisfactory performance; 2) adequately informing students of rules of engagement on matters such as the grading process; 3) providing ongoing assessment of student readiness from a content and knowledge perspective; and, 4) permitting students to apply reflective strategies to facilitate a healthy appreciation of the individual benefits of working in teams (Michaelson & Sweet, 2008). The next section discusses the benefits, as well as the limitations of team-based learning.

Pros and Cons of Team-Based Learning

There are various benefits and limitations associated with team-based learning. Two important benefits of team-based learning are improvement of student's critical thinking and greater teamwork competencies, which are skills required of today's health care providers (Hrynychak & Batty, 2012). Students can begin to value team-based learning through increased mastery of course content, and improved deep-learning facilitated by the combination of knowledge acquisition and application (Michaelson & Sweet, 2008). Other outcomes include appreciation of the pursuit of life-long learning expressed as "interpersonal communication, teamwork, giving constructive feedback, and the skill set for deliberate practice" (Parmelee & Hudes, 2012, p. 413). Students also benefit through improvement of "complex reasoning, debate, and constructive controversy" (Haidet et al., 2012, p. 293). Team-based learning has also proven effective in helping to bridge the gap between high-performing and lower-performing students based on content knowledge (Hrynychak & Batty, 2012; Parmelee & Hudes, 2012).

There are also limitations associated with team-based learning. Haidet et al. (2012) expressed a general concern regarding the various definitions and applications of team-based

learning that could potentially result in institutions dismissing team-based learning as a viable teaching modality (Haidet et al., 2012). Other limitations of team-based learning are: (a) the need for extensive teacher training and expertise, (b) the need for proper facilities, and (c) the need for appropriate instructional materials to be properly implemented (Hrynychak & Batty, 2012). These limitations, while notable, have not deterred the adoption of team-based learning by health sciences programs, as discussed in the following section.

Team-Based Learning in the Health Sciences

The use of various pedagogies to foster team-based learning has increased in the health sciences over recent decades (Mody et al., 2013; Parmelee, DeStephen, & Borges, 2009). The introduction of team-based learning in medical education began with funding provided to Baylor College of Medicine in 2001 by the U.S. Department of Education Fund for the Improvement of Postsecondary Education. This funding was provided “to promote [team-based learning] in health sciences” (Parmelee & Hudes, 2012, p. 411). Other calls for team-based learning came from the Liaison Committee on Medical Education accreditation standard, which encouraged institutions to employ teaching methods that foster in students the “ability to use principles and skills wisely in solving problems of health and disease” (Haidet et al., 2012, p. 292). The health sciences provide unique opportunities to apply team-based learning approaches based on factors such as highly structured course delivery models and a high degree of autonomy, providing faculty with flexibility to incorporate new approaches (Haidet et al., 2012).

As discussed, establishing a higher level of student engagement is a central tenant of team-based learning. Students who experience team-based learning are more inclined to work collaboratively on health care teams and to demonstrate openness and respect for the contributions of other team members (Cerra & Brandt, 2011). Further, high levels of

engagement in the learning process are expected to accelerate the development of effective communication skills and good leadership ability (Haidet et al., 2012). This aspect is likewise attractive in the health sciences, as students who are actively engaged in the learning process foster autonomy and enhance sound judgment (Michaelsen et al., 2008). The development of these competencies is integral to students successfully transitioning to becoming independent healthcare practitioners (Michaelsen et al., 2008). A byproduct of the higher level of engagement is ownership of the learning process to the extent students seek interprofessional experiences outside of structured learning opportunities. In some cases, students have felt compelled by their interest in working across professions to establish student-led organizations that promote interprofessional education (VanderWielen et al., 2014).

Team-based learning is most important in the health sciences context for its ability to foster interprofessional teamwork skills (Mennenga & Smyer, 2010) through enhancing student perceptions of teamwork and interpersonal skills (Smart & Csapo, 2003). One way in which this occurs is through increased value students place on working in teams (Sibley & Parmelee, 2008). The development of this value is often attributed to the social exchange and learning interaction between students that occurs in a team-based learning process. One outcome of the interactions is greater understanding of the role, expertise, and scope of practice of other professions (Kohn, Corrigan, and Donaldson, 2000; Reeves et al., 2008; Cerra & Brandt, 2011).

Team-based learning also places a demand on students to monitor and assess the contributions to the learning process of other team members. In fact, peer monitoring of team performance was seen as critical to assessing teamwork (Michaelsen et al., 2008). However, effective peer monitoring is also linked to the value students place on teamwork. It is asserted that the learning process is greatly hampered if team members do not have a positive attitude

towards teamwork (Brannick & Prince, 1997). Therefore, the importance of the attitudes of students towards teamwork sets the stage for a discussion of the role team-based learning plays in interprofessional education.

Team-based Learning in Interprofessional Education

Interprofessional education provides educational, financial, and health care delivery benefits, as well as enhances student learner competencies and sense of role clarity (VanderWielen et al, 2014). An important aspect of interprofessional education is determining students' preparedness to engage in interprofessional learning (Parsell & Bligh, 1999). There are limited measures available to assess team-based learning that meet a requisite level of validity and reliability (Thannhauser, Russell-Mayhew, & Scott, 2010). Heinemann and Zeiss (2002) shared this concern as editors of *Team Performance in Health Care: Assessment and Development*. While the focus of the book was on the state of measures available to assess team performance in health-care settings, the analysis signaled a need for greater understanding of teamwork across the education and practice continuum.

Since the Heinemann and Zeiss (2002) publication, an appreciable body of research in medicine and other health professions has focused on assessing the attitudes and perceptions of health profession students towards teamwork (Dow, DiazGranados, Mazmanian, & Retchin, 2014; Blue, Chesluk, Conforti, & Holmboe, 2015). This interest is driven largely by a need to better translate the experiences of health profession students to the practice setting (Dow et al., 2014) and the understanding that attitudes students have towards teamwork drives their behavior toward patient care (Heinemann, Schmitt, Farrell, & Brallier, 1999). An examination of the literature revealed three established tools targeted at assessing the attitudinal dimension of teamwork in health profession education settings.

Attitudes toward health care teams scale. Heinemann et al (1999) conducted a three-phased study to develop a measure that assesses attitudes towards healthcare teams among health practitioners and health profession students. The resulting, Attitudes Toward Health Care Teams Scale, consists of 20 items divided into two subscales: Quality of Care/Process and the Physician Centrality subscales. The Quality of Care/Process subscale consists of 14 items assessing perceptions of how well health-care teams provide care, as well as the how the team functions to that end. The Physician Centrality subscale consists of six items and measures the perceptions of team members towards the authority and degree of control physician's project in clinical settings.

Hyer, Ivo, Mezey, and Fulmer (2000) revised the Attitudes Toward Health Care Teams Scale to arrive at a 21-item measure divided into three subscales. The additional subscale was intended to increase the analytic capacity of the tool. There were also changes in subscale labeling in the revised tool to reflect a more positive impression of teamwork. The resulting subscales were Team value (previously labelled, Quality of care), Team efficiency (previously labelled, Costs of team care), and Shared leadership (previously labelled, Physician centrality).

In terms of methodology, there was also a difference in the populations studied. Heinemann et al. (1999) focused their study on healthcare professionals versus a focus on health profession students featured in the study by Hyer et al. (2000). Nevertheless, Hyer et al. (2000) viewed the changes as minor in the broader context and suggested the original conceptual framework remain intact. The Attitudes Towards Health Care Teams Scale was among three measures considered to be "state-of-the-art" (Lovett, Zeiss, & Heinemann, 2002, p. 387). The Attitudes Towards Health Care Teams Scale was also the only measure of the highly-regarded instruments focused on attitudinal aspects of teamwork.

Readiness for interprofessional learning scale. Another measure was developed by Parsell and Bligh (1999) to assess the readiness for students for interprofessional learning. The tool was initially used to assess elements of shared learning and student readiness for interprofessional learning among 120 undergraduate students representing eight health professions. The resulting instrument—Readiness for Interprofessional Learning Scale—is a 3-factor scale that includes “team-working and collaboration,” “professional identity,” and professional roles” (Parsell & Bligh, 1999, p. 95). The global scale had an internal consistency of 0.9 and was determined to be useful in assessing student attitudes and perceptions of shared learning in a multiprofessional context.

The Readiness for Interprofessional Learning Scale was later revised by McFadyen et al., (2005) as a 4-factor model. The Professional Identity subscale was separated into the Negative Professional Identity and Positive Professional Identity. The original subscale was separated to reflect changes that occur in a student’s educational experience (McFadyen et al., 2005). Both versions of the Readiness for Interprofessional Learning Scale have positioned it as the most extensively used tool in examining student attitudes and behaviors with respect to interprofessional education. However, a recent critique of the Readiness for Interprofessional Learning Scale asserts that the instrument has significant structural issues affecting its construct validity that should give pause to its further use (Schmitz & Brandt, 2015).

Value of Teams Survey. An emerging tool to measure attitudes towards teamwork among health profession education students is the Value of Teams Survey. The Value of Teams Survey was developed by Baylor College of Medicine to measure a “students’ perceptions of the value of learning in teams” (Levine et al, 2004, p.272). The tool consists of 17 items encompassed in two dimensions: Value of Group Work and Working with Peers. The Value of

Teams Survey was initially tested among 20 students participating in a psychiatric clerkship. The measure has been further examined among samples within in the healthcare arena (Cheng et al., 2014; Clark, Nguyen, Bray, & Levine, 2008; McMullen, Cartledge, Levine, & Iversen, 2013; Warrier et al, 2013) and within the field of economics (Espey, 2010).

Examining Relevant Research

The availability of an array of instruments to measure student attitudes towards team-based learning has helped to advance research on the influence of attitudes towards teamwork on learning outcomes (Dow et al., 2014). Research has been applied in single health profession settings and settings with multiple disciplines, often with different aims. Studies based in single discipline settings are predominantly used to assess shifts in attitudes of students based on team-based learning experiences. This line of research directly addresses the aim of understanding attitudinal factors of students toward team-based learning or interprofessional education broadly. For example, Clark, Nguyen, Bray, & Levin (2008) employed two separate study designs to examine team-based learning among undergraduate nursing students. A group comparison study design was used first to understand the degree of appreciation for teamwork among students in the context of either a pharmacology course or case management course. The pharmacology course was provided in the traditional lecture format, while the case management course was delivered using Michaelson and Sweet's (2008) team-based learning framework. The first study revealed a statistically significant increase in participation for the team-based learning subgroup in comparison to the lecture subgroup. However, the lecture subgroup had statistically significantly higher enjoyment levels compared to the team-based learning subgroup. The second study used a pre- and post-test design to measure changes in student attitudes regarding the value of team-based learning as a result of their exposure to the learning model. Findings

revealed that the value placed on team-based learning was stable throughout the pre- and post-test analysis. This study was particularly strong in that a dual study design was used to better differentiate the results.

Related studies among other professions such as medicine and pharmacy reported a mix of findings similar to the studies by Clark et al. (2008). Parmelee et al. (2009) examined changes in student attitudes towards team-based learning using a sample of 180 medical students from two separate cohorts from 2004 and 2007 entering classes, respectively. The study demonstrated an increase in receptivity to team-based learning in the areas of professional development, satisfaction with the team experience, and peer evaluations. First year students exhibited more positive attitudes towards professional development and satisfaction with evaluations from peers than second year students. Conversely, second year students displayed more positive attitudes and satisfaction with the team experience than first year students. However, there were no meaningful changes in attitudes between the two cohorts with regard to team impact on the quality of learning or with regard to clinical reasoning ability. Gallegos and Peeters (2011) later modified the tool used in the study by Parmelee et al (2009) to apply to a sample of 58 pharmacy students in order to assess student perceptions of teamwork. Conversely, Gallegos and Peeters (2011) found no statistically significant changes in the attitudes of the pharmacy students towards team-based learning. There were a number of factors that influenced the findings in both studies, respectively. The limited amount of time students had to engage each other prior to being introduced to team-based learning concepts was a common influence affecting the findings in both studies. The importance of orienting students, individually and as a team, helps to leverage the benefits of team-based learning (Michaelsen & Sweet, 2008).

There is also research including students from multiple health profession programs focused on how students perceive, interact, and are impacted by interprofessional learning experiences. Research based in multiple health profession settings is at the heart of the interprofessional education agenda (Reeves, Perrier, Goldman, Freeth, & Zwarenstein, 2013). “To achieve interprofessional teamwork in health care, students from various educational programs need to learn how to collaborate already during their undergraduate education” (Hylin, Lonka, & Ponzer, 2011, p. e204). Worth noting, such research is of particular interest in addressing the attitudes that are typical of students and practitioners from the medical profession. Research shows that the medical profession is most intransigent with respect to embracing the value of other professions (Curran et al., 2008; Hojat et al., 2001; Olenick, Allen, & Smego, 2010; Retchin, 2008; Tunstall-Pedoe, Rink, & Hilton, 2003). For example, in a study by Makary et al. (2006) 60 hospitals were surveyed to assess perceptions of teamwork held by nurses and physicians. The survey demonstrated the professions defined teamwork and collaboration in very different terms. Nurses viewed teamwork and collaboration as broader input in decision-making situations, whereas physicians interpreted teamwork and collaboration as the degree to which other professions agree with the physician’s decision. Meaningful exchanges among health profession students that occur through team-based learning in interprofessional settings can be instrumental in breaking down stereotypical authority roles of physicians in relationship to other health professionals (Retchin, 2008).

Rose et al. (2009) pursued this line of research in a study conducted with a sample of students from occupational and physical therapy, nursing, and medicine. The study’s intent was to measure the perceptions of students towards interdisciplinary education and their attitudes toward interprofessional learning. The study found notable differences among the various

professions in terms of measures of competency and the perceived need for collaboration. Specifically, medicine and physical therapy students had significantly higher ratings for their peers on competency and autonomy, and their need for cooperation. The broader context for this discussion fits within social identity theory⁸, which suggests that an individual's perception of their membership of a particular social group will influence their behavior (Trepte, 2006). Students feeling that they have equal status in the group is important as it limits issues of mistrust (Michaelsen & Sweet, 2008).

Research including students from multiple health professions also has the added advantage of providing insight across a broader array of topical areas with respect to interprofessional learning outcomes. For example, Doucet, Buchanan, Cole, and McCoy (2013) explored the value of team-based learning in a communication course offered to nursing and other health science students in an interprofessional context. The original version of the Readiness for Interprofessional Learning Scale (Parsell & Bligh, 1998) was administered to students at the beginning and end of the course. Results showed improved interprofessional awareness, enhanced communication and collaboration skills, and student satisfaction with the course over the pre- and post-evaluations. The study also highlighted the importance of heterogeneous teams, particularly based on professional affiliation, as a means of increasing awareness and respect for other professions. In addition, the immediate and ongoing application of knowledge in a safe environment was shown to be important as a means of reinforcing interprofessional competencies.

Similarly, work by Neville, Petro, Mitchell, and Brady (2013) addressed key objectives such as professional identity and role clarity. The study used a sample of 61 second-year

⁸ Social identity theory was introduced by Henry Tajfel (1982) as that part of an individual's self-concept in relationship to their knowledge of their membership in a social group.

students from multiple health profession programs to assess the effectiveness of a pilot interprofessional team decision-making course. There were a number of findings including: a willingness by students to engage in a collective learning process to solve clinical problems; a willingness to contribute as a part of a team in spite of strong beliefs regarding the importance of having professional identity; a positive perception of their role in relation to students from other health professions; and, an increased ability to identify the effect of team decision making on the delivery of patient-centered care.

In all, team-based learning has had a transformative impact on the health professions. Despite limitations in our understanding of the full impact, the evidence is encouraging within populations of students who are currently enrolled in health profession programs. The next frontier for exploration of the merits of team-based learning is within the context of pre-health profession students.

Applications of Team-Based Learning in Pre-health Student Populations

What is currently understood from the extant literature is that the early introduction of health profession students to learning experiences that involve teamwork can be helpful in curtailing negative attitudes and behaviors towards teamwork that interfere with the educational aims of interprofessional education (Parmelee, DeStephen, & Borges, 2009; Williams et al., 2012). The broader discourse is focused on exactly when it is best to introduce students to interprofessional education. Some guidance can be surmised from the following statement offered by a proponent of interprofessional education,

We know that interprofessional collaboration is key to providing the best in patient care. That means we need to ensure our health and human services students gain the knowledge and skills they need through interprofessional education that begins at the earliest stages of their schooling (World Health Organization, 2010, p.36).

This lingering indecisiveness with respect to the question of *when* seems to have stifled the pursuit of research on the implications and possibilities of exposing aspiring health professionals to more team-oriented learning experiences in an interprofessional education context. However, there is a limited body of research that has been conducted on attitudes concerning teamwork among pre-health student populations that can serve as a foundation for further investigation (Engle, 2008). For example, the benefits of team-based learning on student academic outcomes has been examined in undergraduate prerequisite courses such as general chemistry (Hockings, DeAngelis, & Frey, 2008), genetics (Engle, 2008), and biochemistry (Garrett, 2008).

In addition, other studies have gone a step further in examining the merits of interprofessional education among pre-health students. Hoffman and Harnish (2007) provide a sound rationale for incorporating interprofessional education in the preparation of pre-health students through a study exposing 161 first-year health sciences bachelor-degree seeking students to interprofessional education concepts. The students explored these areas using one of three learning modalities: self-directed research, problem-based learning, and group discussions. The analysis focused on three outcomes that included the level of satisfaction with the program, shifts in student attitudes and perceptions, and the degree of knowledge acquisition. Findings demonstrated consistent increases from the pre- to post-test responses with regard to program satisfaction, positive attitudes towards interprofessional education, and gains in knowledge.

Another study targeting pre-health student populations focused on student perceptions of interprofessional learning to determine if there was disparate impact based on the student's health profession interest (Dumke et al., 2016). Dumke et al. (2016) used the context of a summer enrichment program to assess changes in the perceptions and interactions of pre-health

students exposed to interprofessional learning. The study was conducted among 51 juniors, seniors, and post-baccalaureate-level students who chose either the pharmacy, medicine, dentistry, or physical therapy program tracks. The measures used included the Attitudes Towards Health Care Teams Scale and the revised Readiness for Interprofessional Learning Scale. The measures were chosen based on research indicating their use with student populations versus other scales that focus on teamwork performance among health profession practitioners. General findings demonstrated that pre-health student attitudes can be influenced with structured, and relatively limited, exposure to interprofessional educational concepts and case-based assignments. Specific findings showed differences in the attitudes concerning interprofessional learning at the onset of the program, with pharmacy students showing more positive attitudes than dentistry students. These differences were eliminated at the conclusion of the program. Further, there was an overall positive view for various aspects of interprofessional education to include teamwork and collaboration, team value, and team efficiency.

In summary, there is an imminent need for higher education institutions to prepare students to do work in professional health care teams. Team-based learning is presented as an answer to this trend and “offers a structured, student-centered learning strategy that focuses on active learning...” (Mennenga & Smyer, 2010). The validity of team-based learning is reinforced when compared to the best practices in pedagogy identified in educational research (Michaelsen & Sweet, 2011). As such, team-based learning is gaining appeal across a wide range of academic disciplines to include the health sciences.

The use of team-based learning approaches in the health sciences is not a new phenomenon and is now considered essential to education programs that prepare students for health careers. The general thrust of the research on teamwork in the health sciences focuses on

the efficacy of teamwork within clinical settings, targeting practitioners or currently enrolled health profession students (Dow et al., 2014; Heinemann and Zeiss, 2002). There is a case being established that supports the infusion of the concept of teamwork within pre-health student populations. However, the scope of this emerging research is on justifying the merits of interprofessional education in that population of students. As such, no research was uncovered that sought to understand factors that may influence the attitudes of students at any level towards teamwork. The next section reviews the conceptualization, measurement, and critiques of emotional intelligence as a potential factor that has been associated with team-based learning (Clarke, 2010a, 2010b; Ilarda & Findlay, 2006; McQueen, 2003). The section concludes with an examination of emotional intelligence in higher education and health sciences' contexts.

Emotional Intelligence

There is no consensus definition of emotions. Generally, psychologists view emotions as “ongoing states of mind that are marked by mental, bodily, or behavioral symptoms” (Parrot, 2001, p.3). “Properly used, the emotions are an essential tool for successful and fulfilling life” (Culver, 1998, p. 2). Traditionally, human performance has been assessed within the context of cognitive ability and personality. However, emotional intelligence has surfaced as a useful means of explaining human behavior (Schulte, Ree, & Carretta, 2004, p. 1059). Emotional intelligence is an extension of earlier concepts of social intelligence (Bar-On, 2006; Crowne, 2009; Salovey & Mayer, 1990; Warwick & Nettelbeck, 2004), which is expressed as the “ability to manage people” (R. Thorndike, & Stein, 1937, p. 275). Emotional intelligence has been widely researched across a number of disciplines (Riemer, 2003) to include business and employment (Culver, 1998; Schutte et al., 1998); engineering and education, including the health

sciences (Benson, Ploeg, & Brown, 2010; Rochester, Kilstoff, & Scott, 2005; Wessel et al., 2008).

Emotional intelligence is considered an important quality to possess in successfully navigating interpersonal relationships, as well as in an individual's personal life and career (Naeem et al., 2014). Emotional intelligence has also been shown to influence performance in academic settings (Cadman & Brewer, 2001; Culver, 1998; Parker et al., 2004), and in the health professions (Beauvais, Brady, O'Shea, & Griffin, 2011; Carr, 2009; Naeem et al., 2014).

This section provides an overview of emotional intelligence to include its varied definitions, conceptualizations, and measurements. The section further discusses emotional intelligence in the context of undergraduate student populations and in the health professions.

Overview of Emotional Intelligence

The concept of emotional intelligence emerged over two decades ago and has experienced broad popularity in research and commercial communities (Stough, Saklofske, & Parker, 2009). Mayer and Salovey (1997) introduced the concept of emotional intelligence in the 1990s. Since its introduction, emotional intelligence has been defined and conceptualized in multiple ways. The *Encyclopedia of Applied Psychology* (Spielberger, 2004) elevated three conceptualizations of emotional intelligence as primary strands to address the growing confusion surrounding emotional intelligence. The strands included models developed by Mayer and Salovey (1997), Goleman (1998), and by Bar-On and Parker (2000). The models were further categorized into one of two models: the ability model and the mixed-model.

The Mayer and Salovey (1997) model is considered an ability-model and defined emotional intelligence as, "the ability to perceive accurately, appraise, and express emotion; the ability to access and/or generate feelings when they facilitate thought; the ability to understand

emotion and emotional knowledge; and the ability to regulate emotions to promote emotional and intellectual growth” (p. 10). This view of emotional intelligence is equated with traditional conceptualizations of intelligence in which emotions and cognition form a set of skills that can be measured by maximal performance tests (Stough et al., 2009). Earlier views of the ability model suggested it is relatively stable over the course of an individual’s life; however, other perspectives suggest it is more pliable than traditional intelligence concepts and responsive to interventions (Zeidner, Roberts, & Matthews, 2002).

The mixed-model is defined by a broader array of underlying concepts to include cognitive, personality, and affective characteristics (Stough et al., 2009). The foundational work characterized as mixed-model is attributed to Daniel Goleman and Reuven Bar-On (Stough et al., 2009). Goleman’s (2001) conceptualization of emotional intelligence is grounded in Howard Gardner’s multiple intelligence theory and specifically, the interpersonal and intrapersonal dimensions of multiple intelligence theory. Goleman positions emotional intelligence as a competency that can be learned and have a tangible influence on an individual’s work performance (Boyatzis, Goleman, & Rhee, 2000). This perspective of emotional intelligence corresponds with Goleman’s intention for the understanding of emotional intelligence to be used as a means of improving human performance (Goleman, 2001). Goleman is attributed with broadening the accessibility of emotional intelligence concepts to the general public (Bar-On, 2006; Culver, 1998) with the publication, *Emotional Intelligence* (Culver, 1998). Goleman also effectively argued for the use of emotional intelligence broadly in academic settings (Boyatzis et al.; Culver, 1998). A primary differentiation between the mixed-model and the ability model is its methods of measurement. The mixed-model consists of various self-reporting instruments, whereas the ability model features maximum performance tests (Conte, 2005).

The mixed-model is also more expansive conceptually as it encompasses aspects such as personality and other non-cognitive attributes, skills and abilities, and competencies (Livingstone & Day, 2005).

Bar-On (2006) offered another conceptualization of emotional intelligence also characterized as a mixed-model. The Bar-On conceptualization is termed emotional-social intelligence and defined as a “cross-section of interrelated emotional and social competencies, skills and facilitators that determine how effectively we understand and express ourselves, understand others and relate to them, and cope with daily demands” (Bar-On, 2006, p. 14). This approach to emotional intelligence includes the cognitive-based emotional processing capacity characteristic of the ability model, as well as the functioning and performance capacity of individuals (Wood, Parker, & Keefer, 2009). Similar to Goleman’s elevation of emotional intelligence in a popular sense, Bar-On’s work with emotional intelligence has increased the prominence of emotional intelligence in the research literature (Bar-On, 2006). As such, the work by Bar-On has extended beyond workplace settings to having value in academic areas (Benson, Ploeg, & Brown, 2009).

Petrides (2010) made a significant departure from the established categorization of emotional intelligence as being either an ability-based model or mixed-model. This perspective introduced another model of emotional intelligence called trait emotional intelligence (or trait emotional self-efficacy) that is accumulating empirical research to support its validity and utility (Petrides, 2010). Trait emotional intelligence is defined as “a constellation of emotional self-perceptions located at the lower levels of personality hierarchies” (Petrides, 2010, p. 137). Trait emotional intelligence operates as a subset of personality that is distinct from traditional intelligence concepts (Petrides, Furnham, & Frederickson, 2004). Trait emotional intelligence is

highly behaviorally oriented and is distinguished from the ability model of emotional intelligence in that it is based on information-processing constructs (Petrides & Furnham, 2000b). In fact, Petrides (2010) asserts that trait emotional intelligence is a different construct than the ability and mixed-models of emotional intelligence in that it is the only operational definition of emotional intelligence that embraces the subjective nature of emotions.

The varied conceptualizations of emotional intelligence present challenges for proponents and are the subjects of ongoing critique (Conte, 2005; Murphy, 2006; Stough et al., 2009). Chief concerns with emotional intelligence are related to its varied definitions, exaggerated claims, and strong association with existing constructs such as personality (Murphy, 2006). The lack of a coherent definition continues to attract calls for a coalescing around one definition of emotional intelligence (Cherniss, 2010). However, the impact of this shortcoming is lessened as more recent scholarship demonstrates emotional intelligence can enhance performance in the workplace (Bar-On, 2010; Kooker, Shoultz, & Codier, 2007); academic outcomes (Bar-On, 2010; Beauvais et al., 2011; Ruiz-Aranda, Salguero, & Cabello, 2012; Schneider, Lyons, & Khazon, 2013); and group or team performance (Barczak, Lask, & Mulki, 2010; Ilarda & Findlay, 2006; Luca & Tarricone, 2001).

Murphy (2006) also referenced concerns with overstatements of the impact of emotional intelligence in improving performance in workplace and academic settings. The exaggerated claims of the benefits of emotional intelligence are considered the main source of the controversy that surrounds emotional intelligence (Murphy, 2006). The specific contention is that claims made of its impact exceeded what is actually demonstrated in research (Murphy, 2006). Murphy provided an example of such claims including assertions that emotional intelligence “might be more important than IQ. . .” (Murphy, 2006, p. x). Messages regarding emotional intelligence in

popular culture have gone even further as illustrated by the assertion that “emotionally effective behavior is the magic wand that opens—not the future—but the present moment. . .” (Hughes, Thompson, & Terrell, 2009, p. i).

Finally, Murphy’s (2006) concerns about the overlap of emotional intelligence with personality constructs are much more complicated and depend greatly on which model of emotional intelligence is being considered. Research has largely focused on the suspected overlap of emotional intelligence and the five-factor personality model, specifically the Big Five construct. Studies have found differing correlations among the ability and mixed-models of emotional intelligence and the Big Five (Murphy, 2006). The picture is further complicated as one investigates correlations at the sub-factor level of emotional intelligence and the Big Five dimensions.

Despite important critiques of emotional intelligence there is evidence to support its legitimacy and utility. Murphy (2006), although highly critical of emotional intelligence, suggests there is value in the concept if scholars come to consensus around a coherent definition. There is also optimism for emotional intelligence based on a growing evidentiary base. For example, Van Rooy and Viswesvaran (2004) conducted a meta-analysis examining the construct and predictive validity of various emotional intelligence tools. Results indicated a relatively strong predictive ability ($p = .23$) in assessing workplace performance compared to other selection methods, such as reference letters, which warrants future examination. There is also evidence to support its usefulness in predicting higher cognitive ability (Lam & Kirby, 2002), and in analyzing group differences based on demographic attributes (Van Rooy, Alonso, & Viswesvaran, 2005). This evidence is, of course, predicated on various measurements used to assess emotional intelligence.

Measuring Emotional Intelligence

The increased interest in emotional intelligence is associated with a number of challenges in terms of its definition, measurement, and application (Petrides, Furnham, & Frederickson, 2004). This section will describe emotional intelligence measures that were developed by the leading theorists of each of the three models. The discussion will also address research that provides further insight into the applicability and adaptability of emotional intelligence to various academic settings.

The original conceptualization of emotional intelligence by Mayer, Caruso, and Salovey (1999) led to the development of the Multifactor Emotional Intelligence Scale (MEIS). The MEIS was developed based on three requisite criteria used to frame traditional intelligence to include: “be[ing] capable of being operationalized as a set of abilities...meet[ing] certain correlational criteria...and develop[ing] with age and experience” (Mayer et al., 1999, p. 267). The developers used a multifaceted approach to validate the instrument using target, consensus, and expert scoring techniques (Conte, 2005). The MEIS has 402 items contained within four subscales to include: “perception, assimilation, understanding, and managing emotions” (Conte, 2005, p. 435). The measure was reported to align with criteria used to frame traditional intelligence (Mayer et al., 1999).

Mayer, Salovey, Caruso, and Sitarenious (2003) later developed a measure called the Mayer-Salovey-Caruso Emotional Intelligence Test, referred to as the MSCEIT V.2 (MSCEIT). The MSCEIT addressed issues with scoring and low reliability scores that were found with the MEIS (Conte, 2005). Mayer et al. (2003) examined the validity of the MSCEIT along three dimensions: (a) comparison of responses from a sample of experts with a background in researching various aspects of human emotions and participants from a general standardization

sample, (b) reliability testing, and (c) potential emotional intelligence factor structure. The measure also demonstrated strong reliability using general and expert scoring criterion with $r = .93$ and $.91$, respectively (Mayer et al., 2003, p. 101). In addition, theoretical dimensions of emotional intelligence captured by the MSCEIT were supported by confirmatory factor analysis.

Bar-On developed a measure of emotional social intelligence in the 1980s as “an experimental instrument designed to examine the conceptual model of emotional and social functioning” (Bar-On & Parker, 2000, p. 363). The Emotional Quotient Inventory (EQ-i) was introduced in 1997 (Bar-On & Parker, 2000, p. 364). The EQ-i is a self-report measure and considered to be personality-based (Murphy, 2006). The EQ-i consists of 133 items scored using a 5-point Likert scale, ranging from *very seldom or not true of me* to *very often true of me or true of me* (Bar-On, 2006, p. 13). The measure has 15 subscales that are subsumed under five factors (see Table 2 for factor and scale listings) and provides a total EQ-i score and composite factor scores (Bar-On, 2006). The EQ-i has a reported $.76$ average internal consistency based on studies that included participants from seven countries (Bar-On, 2006). In a study by Dawda and Hart (2000), EQ-i demonstrated a $.96$ internal consistency. The measure developed by Bar-On at one point was reported to be the most widely used measure of emotional intelligence (Bar-On, 2006).

The Emotional Competency Inventory (ECI) was developed by Goleman and Boyatzis (Boyatzis, Goleman, & Rhee, 2000) to measure an array of emotional competencies that promote positive social behaviors. The instrument reflected Goleman’s original distillation of a broad body of research conducted with the intent of providing a form-based instrument that was easy to administer (Boyatzis et al., 2000). The ECI was initially constructed based on a previous instrument referred to as the Self-Assessment Questionnaire (Goleman, 1998). The ECI

consisted of five clusters entailing 25 competencies. The clusters included: (a) self-awareness, (b) self-regulation, (c) motivation, (d) empathy, and (e) social skills. The instrument was developed using a sample of 596 subjects consisting of managers and salespeople from various industries and graduate students from multiple disciplines (Goleman, 1998). The ECI has undergone several revisions since its introduction. The current commercialized version is offered by the Hay Group and consists of 18 competencies positioned under four clusters that include: (a) self-awareness, (b) social awareness, (c) self-management, and (d) social skills (Goleman & Boyatzis, 2001). The instrument uses a composite measurement approach consisting of a 360-degree assessment model including self-, peer-, and supervisor ratings (Goleman & Boyatzis, 2008).

Petrides developed the Trait Emotional Intelligence Questionnaire (TEIQue) to address what was argued to be conceptual flaws found in cognitive-based (or ability-based) constructs of emotional intelligence (Petrides, 2010; Petrides et al., 2004). The underlying concern stated with ability models of emotional intelligence is the dismissal of the highly subjective nature of emotions that prohibit the development of objective measures (Petrides, 2010). The TEIQue is a 153-item measure with 15 facets constituting four factors that include well-being, emotionality, self-control, and sociability (Perez, Petrides, & Furnham, 2005). The TEIQue has shown high internal reliability at the global level (.92 alpha) and moderately high at the 4-factor level (average alpha-.783) (Sanchez-Ruiz, Perez-Gozales, & Petrides, 2010). Petrides (2009) also examined the psychometric properties of the TEIQue trait emotional intelligence measure with a focus on understanding gender distinctions. The study showed an internal consistency of .89 for female subjects and .92 for male subjects using the global trait score (Petrides, 2009).

A synopsis of each primary measurement of emotional intelligence and the associated dimensions are displayed in Table 1.

Table 1

Inventory of Popular Emotional Intelligence and Emotional Competency Measures

| Salovey and Mayer model | Goleman model | Bar-On model | Petrides and Furnham model |
|--|--|---|--|
| <p>Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT)–141 items, 4 subscales (branches). Mayer, Salovey, Caruso, & Sitarenious (2003).</p> <p>Perceiving emotions branch:</p> <ul style="list-style-type: none"> • Perception of emotions in oneself, others, objects, art, stories, music, and other stimuli. <p>Facilitating thought/using emotions branch:</p> <ul style="list-style-type: none"> • Able to generate, use and feel emotion; communicate feelings, or incorporate them in other cognitive processes. <p>Understanding emotions branch:</p> <ul style="list-style-type: none"> • Able to understand emotional information and how to interact through relationship transitions and done with requisite appreciation of emotional feelings. | <p>Emotional Competency Inventory (ECI)–110 items, 5 subscales (clusters). Boyatzis, Goleman, & Rhee, Clustering competence in emotional intelligence: Insights from the ECI (2000).</p> <p>Self-awareness cluster:</p> <ul style="list-style-type: none"> • Emotional self-awareness • Accurate self-awareness • Self-confidence <p>Self-management cluster:</p> <ul style="list-style-type: none"> • Emotional self-control • Transparency • Adaptability • Achievement • Initiative • Optimism <p>Social awareness cluster:</p> <ul style="list-style-type: none"> • Empathy • Organizational awareness • Service orientation <p>Relationship management or social skills cluster:</p> <ul style="list-style-type: none"> • Developing others • Inspirational leadership • Influence | <p>Bar-On Emotional Quotient Inventory (EQ-i)– 133 items, 5 subscales (Bar-On, 2006).</p> <p>Intrapersonal:</p> <ul style="list-style-type: none"> • Self-regard • Emotional self-awareness • Assertiveness • Independence <p>Self-actualization</p> <p>Interpersonal:</p> <ul style="list-style-type: none"> • Empathy • Social responsibility • Interpersonal relationship <p>Stress management:</p> <ul style="list-style-type: none"> • Stress tolerance • Impulse control <p>Adaptability:</p> <ul style="list-style-type: none"> • Reality testing • Flexibility • Problem solving <p>General mood:</p> <ul style="list-style-type: none"> • Optimism • Happiness | <p>Trait Emotional Intelligence Questionnaire (TEIQue)–153 items, 15 facets encompassed in 4 factors (Petrides, 2009).</p> <p>Well-being:</p> <ul style="list-style-type: none"> • Trait happiness • Trait optimism • Self-esteem <p>Self-control:</p> <ul style="list-style-type: none"> • Stress management • Impulsiveness (low) • Emotion regulation <p>Emotionality:</p> <ul style="list-style-type: none"> • Trait empathy • Emotion perception • Emotion expression • Relationships <p>Sociability:</p> <ul style="list-style-type: none"> • Emotion management • Assertiveness • Social awareness |

Table 1 - continued

| Salovey and Mayer model | Goleman model | Bar-On model | Petrides and Furnham model |
|--|--|--------------|----------------------------|
| Managing emotions branch: •Openness to feelings with the ability to modulate them in oneself and others in promotion of personal understanding and growth. | •Change •Conflict management •Teamwork and collaboration | | |

Adapted from “Measuring Emotional Intelligence With the MSCEIT V2.0 by J. D. Mayer, P. Salovey, D. R. Caruso, and G. Sitarenious, 2003, *Emotion*, 3(1), 97-105; “Clustering Competence in Emotional Intelligence: Insights From the Emotional Competence Inventory (ECI),” by R. E. Boyatzis, D. Goleman, and K. Rhee, 2000, *Handbook of Emotional Intelligence*, p. 343-362; “The Bar-On Emotional Quotient Inventory (EQ-i). *Technical Manual*, Toronto, CA: Multi-Health Systems.

The broad array of measures facilitates an extensive examination of emotional intelligence, as well as widens the possibility for the application of emotional intelligence concepts to academic, workplace, and social settings (Petrides et al., 2004). The choice of which emotional intelligence model to use has implications for how results are to be interpreted and how they are ultimately applied (Petrides et al., 2004). For the purposes of this study, trait emotional intelligence as conceptualized by Petrides and Furnhan (2000) is chosen for the ensuing reasons.

Petrides (2010) asserts there are effectively two competing models of emotional intelligence that consist of the ability model and trait emotional intelligence model. According to Petrides (2010), there are two conceptual and practical advantages of the trait emotional intelligence over the ability model. First, conceptually the trait emotional intelligence model embraces the subjective nature of emotions. As characterized by Robinson and Clore (2002), “Emotions are momentary experiences that are intimately tied to the ebb and flow of everyday life...” (p.934). In other words, the knowledge or identification of emotions does not automatically equate to a related set of behaviors that can be measured by a test (Brody, 2004). A second conceptual advantage cited is trait emotional intelligence model has a relationship to existing personality constructs and theories such as social intelligence that broadens its utilization and value in research contexts (Petrides, 2010).

A significant practical benefit of the trait emotional intelligence model over the ability model is its inclusion of the range of other self-report measures (Petrides, Furnham, & Frederickson, 2004). By comparison, there are relatively few measures to access emotional intelligence from a maximal-performance (ability) perspective. The incorporation of most self-report measures in the trait emotional intelligence model expands the opportunity for future

comparative research (Petrides, 2011). In addition, contrary to traditional definitions of a *trait* as having a static quality (Mischel, 1973), the trait emotional intelligence model can be developed with training and other interventions (Petrides, Furnham, & Frederickson, 2004). The ability to develop trait emotional intelligence through training and experiences is supportive of the long-term aim of this study to inform the programs and preparation strategies of students pursuing health careers. Conversely, the ability model is developed as a static personal quality that is relatively stable over the course of an individual's lifetime (Petrides, Furnham, & Frederickson, 2004).

Further, the establishment of trait emotional intelligence within the personality space is appealing in terms of this study's analytic aims. From an applied perspective, it is important to understand whether outcomes relative to improving attitudes towards team-based learning can be achieved using existing personality tools versus introducing emotional intelligence interventions. There are other practical considerations supporting the use of the trait emotional intelligence model. There is congruence of the TEIQue measure with the conceptualization of the trait emotional intelligence (Petrides, Furnham, & Frederickson, 2004). As well, there is the availability of a validated, shorten version of the original instrument (Furnham & Petrides, 2003). Finally, the TEIQue is cost-effective as it is free for public use in research (Petrides, 2009).

In summary, for a period following the introduction of emotional intelligence research trailed the popularity and use of it (Petrides et al., 2004). The distance has closed over the past decade as scholars have examined the validity and utility of emotional intelligence across a number of settings. The health sciences have been a target for previous research on emotional intelligence but the topic is in need of further exploration.

Emotional Intelligence in the Health Sciences

There is a paucity of research on the role and utility of emotional intelligence in the health professions. The case has been made for an increased focus on emotional intelligence in higher education as a vehicle to improve the academic, personal, and social experience of undergraduate college students (Vandervoort, 2006). There has also been research to understand the influence of emotional factors on undergraduate college student career decision-making (Brown, George-Curan, & Smith, 2003; Hackett & Betz, 1995; Vandervoort, 2006). The emphasis of the prior research, however, has focused on the influence of emotional intelligence on student performance in undergraduate student populations. The findings from research in this focus area have been mixed at best (Zeidner, Matthews, & Roberts, 2002). For example, research examining the predictive capacity of emotional intelligence on undergraduate student grade point averages (GPA) has demonstrated a strong association with students' GPA over the course of a full academic year (Parker et al., 2004). Conversely, other research using two separate emotional intelligence measures have found limited predictive ability with respect to GPA (O'Conner & Little, 2003) or no correlation with either total scores or sub-factors scores with GPA (Newsome, Day, & Catano, 2000).

The interest in emotional intelligence is increasing in the health professions to the point of being considered a competency that future health care professionals might require in order to successfully navigate the new health care landscape (Brannick et al., 2009). There is evidence to support the positive outlook across the health sciences continuum such as in the selection of medical students (Carr, 2009; Carrothers, Gregory, & Gallagher, 2000) as a predictor of success in clinical and academic settings (Beauvais et al., 2011; Suliman, 2010); and when developed in students in early stages, improves their performance in practice settings (Benson et al., 2010).

Nursing has led the way in exploring the merits of emotional intelligence in both workplace and academic settings. Emotional intelligence is argued to be a relevant attribute nurses require in order to have effective social interactions with patients or to mitigate the effects of “emotional labor” (McQueen, 2003, p.103), which entails a frequent masking of a nurse’s emotional state to satisfy the patient (McQueen, 2003). This issue connects to a broader contention that emotional intelligence is essential to the maintenance of nurses’, and other health professionals’, mental and emotional well-being (Birks, McKendree, & Watt, 2009; Oginska-Bulik, 2005; Pau et al., 2006; Por, Barribal, Fitzpatrick, & Roberts, 2010). Emotional intelligence has also been suggested as a part of a constellation of factors that applicants should be screened for in the hiring process for nurses (Cadman & Brewer, 2001).

An example in the academic setting is work by Benson et al. (2010) that investigated whether total and subfactor level emotional intelligence scores were correlated with student classification across the four years of their education experience. A higher emotional intelligence score indicated a greater degree of emotional and social functioning. The sample of students were from three courses using problem-based learning, small group, and self-directed teaching modalities. The results showed a significant difference among students’ total emotional intelligence scores across the four years. The results also indicated emotional intelligence scores were progressively higher with respect to the four years. There were also significant differences on the interpersonal and stress management subscales where fourth-year students scored higher than first-year students.

Other disciplines such as medicine have also examined the merits of emotional intelligence. In the work by Carr (2009), multiple instruments were administered to 304 fifth and sixth-year undergraduate senior medical school students. The analysis examined

correlations among emotional intelligence scores of senior medical students and scores from selection criteria including: The Tertiary Entrance Rank, which measures academic ability; the Undergraduate Medical and Health Sciences Admission Test, which measures logical reasoning, problem solving, the ability to understand people, and nonverbal reasoning; and structured personal interviews. Results demonstrated a break along lines of gender, ethnicity, and select emotional intelligence branches. Emotional intelligence scores for males were higher than females, and Asian students had higher scores than White students in total and for emotional intelligence subfactor scores. There were no significant correlations between emotional intelligence and any of the selection criteria scores.

In summary, emotional intelligence is a diverse concept with three leading frameworks sharing a common function to assist individuals in engaging their emotions and the emotions of others (Cherniss & Goleman, 2001). It is one of the more widely researched concepts that has expanding applications across many disciplines settings (Petrides et al., 2004). Within the health sciences context, emotional intelligence has been associated with the well-being of both patients and providers and viewed as an essential competency for future health care professionals in order to successfully navigate the new healthcare landscape (Brannick et al., 2009). Ilarda & Findlay (2006) took the linkage a step further in arguing emotional intelligence actually ignites a “predilection” (p.19) in individuals towards teamwork. Emerging research demonstrating the efficacy of emotional intelligence in team-based learning situations, while mixed, is encouraging. However, the concept of cultural intelligence also exists within the social intelligence space and could further amplify the benefits of teamwork in the health sciences arena. The next section extends the discussion to cultural intelligence, which addresses the cross-cultural dimensions of social interaction (Crowne, 2009).

Cultural Intelligence

At the turn of the 21st century, the world experienced a rise in globalization that fostered increased levels of connectivity among individuals from diverse backgrounds (Ang, Van Dyne, & Tan, 2011 check date). Organizations are becoming more diverse, and as such, require employees to increase their understanding of the various dimensions of the human self, as well as the ability to function within diverse groups (Sternberg, 2004). The issue of diversity creates numerous opportunities and challenges in the health-care industry. The preparation of a workforce prepared to address the needs of an increasingly diverse patient population is now considered an imperative. According to Sullivan (2004), many health institutions struggle with the attempt to build cultural competence within their organizations; consequently, excellence in health professions education is difficult to achieve. The discourse with respect to cultural competency is also occurring in the context of interprofessional education (Pecukonis et al., 2008). As health sciences programs continue to invest in interprofessional program models, the ability of students to become adept in working within cross-cultural teams is mission critical (Pecukonis et al., 2008).

Cultural intelligence is a relatively new concept that is specifically focused on encouraging effective interactions among diverse groups (Ang et al. 2007; Ang et al., 2015). This section provides an overview of the concept of cultural intelligence, a review of the conceptualization and measurement of cultural intelligence, and important to this study, a review of how cultural intelligence has been applied in higher education and its potential implications for the health sciences.

Cultural Intelligence Conceptual Frameworks, Sub-dimension Interactions, and Measurement Development

Conceptual frameworks for cultural intelligence. The concept of cultural intelligence has its origins in business and organizational settings (Ang et al., 2015) as a concept focused on informing management practices (Thomas et al., 2008). Cultural intelligence arose in large part to address issues faced in workplace environments that are increasingly confronted with the impact of globalization (Ang et al., 2007; Early & Mosakowski, 2004). However, in recent years the application of cultural intelligence has extended into a range of industries to include education and healthcare (Ang et al., 2015).

Cultural intelligence was introduced as a concept by Earley and Ang (2003) and is defined as a “person’s capability for successful adaptation to new cultural settings, that is, for unfamiliar settings attributable to cultural context” (Earley & Ang, 2003, p. 9). Early and Ang (2003) developed a multidimensional concept that entails four sub-dimensions of intelligence: metacognitive, cognitive, motivational, and behavioral (Ang et al., 2007; Ward, Wilson, & Fischer, 2011). The cultural intelligence subdimensions are described below.

Metacognitive cultural intelligence. “Reflects the level of cultural consciousness and awareness during interactions with those from different cultural backgrounds” (Van Dyne et al., 2008, p.17). It entails higher order cognitive strategies that facilitate an awareness of the cultural norms and practices of differing cultures. This functioning occurs both prior to engaging in cross-cultural interactions, as well as during the exchange (Rockstuhl et al., 2011).

Cognitive cultural intelligence. “Reflects a measure of cultural knowledge of norms, practices, and conventions in different cultural settings” (Van Dyne et al., 2008, p.17).

Cognitive cultural intelligence differs from metacognitive cultural intelligence in that knowledge of differing cultures is obtained experientially (Rockstuhl et al., 2011) and facilitates the application of this knowledge in interactions (Crowne, 2009).

Motivational cultural intelligence. “Reflects the capability to direct attention and energy toward cultural differences” (Van Dyne et al., 2008, p.17). Motivational cultural intelligence is an expression of interest to learn and interface with a differing culture (Crowne, 2009).

Behavioral cultural intelligence. “Reflects the capability to exhibit appropriate verbal and nonverbal actions when interacting with people from different cultural backgrounds” (Van Dyne et al., 2008, p.17). Individuals exhibiting high behavioral cultural intelligence often exercise flexibility and real-time adjustments based on cultural questions (Rockstuhl et al., 2011).

The four subdimensions interact together (Crowne, 2009). The dimensions are malleable, which suits the need for adjustment that occurs in cross-cultural interactions (Wang, Heppner, Wang, & Zhu, 2015). There still remains a degree of uncertainty with respect to how the subdimensions interact and the implications of other situational and environmental factors (Wang et al., 2015).

Research on cultural intelligence fundamentally seeks to understand why some people are adept at navigating culturally diverse situations and others are not as adept (Ang & Van Dyne, 2008). It addresses the variability and appropriateness of behavior in culturally diverse contexts (Early & Ang, 2003). Cultural intelligence is important to the learning function in diverse group member settings and exhibits three benefits, including the capacity to recast perceptions of other cultures, change self-concept, and change pre-existing perceptions of people from different

cultures (Silberstang & London, 2009). Early and Ang (2003, p.62), “refer to culturally intelligent behavior as action implemented, and not merely planned”.

There have been other conceptualizations of cultural intelligence since its introduction by Early and Ang; however, cultural intelligence maintains a coherent construct that aids in its operationalization, validation, and utility across various industries (Ang et al., 2008). Work by Thomas et al. (2008) provides a comprehensive review of the emergent conceptualizations and definitions of cultural intelligence. Thomas et al. (2008) defines cultural intelligence to be “a system of interacting knowledge and skills, linked by cultural metacognition, that allows people to adapt to, select, and shape the cultural aspects of their environment” (p. 127). The dimensions of cultural intelligence in this framework include cultural knowledge, cultural skills, and cultural metacognition. The interaction and ultimate expression of the dimensions result in culturally intelligent behavior (Thomas et al., 2008). Thomas et al. (2008) viewed the dimensions as an integrated system. This addressed what was considered a shortcoming in other frameworks that led to the characterization of cultural intelligence as no more than a “loosely aggregated set[s] of facets conceptually similar to intercultural competency, global mindset or a host of other similar terms” (Thomas et al., 2008, p. 124).

Another difference between the framework by Thomas et al. (2008) and that by Early and Ang (2003) is the removal of the motivational dimension. Thomas et al. argue that in spite of motivation occupying a central place within other cultural intelligence frameworks, it is done so in error in that motivation and intelligence can have a converse relationship. In other words, individuals can be motivated to exhibit culturally intelligent behaviors while being inspired to do so based on other incentives (Thomas et al., 2008). This aspect of the Thomas et al. (2008) concept reflects a complete departure from the conceptualization by Early and Ang (2003).

With respect to how the components interact, Thomas et al. (2008) assert the framework by Early and Ang (2003) suffers from not positioning the dimensions as a system of interactive components. This characterization is not completely accurate. As stated by Ang and Van Dyne (2008, p.7), “. . .we view metacognitive, cognitive, motivational, and behavioral CQ [cultural intelligence] as different types of capabilities that *together* [italics added] form the overall CQ [cultural intelligence] construct”. It is important to note, however, that the framework by Thomas et al. (2008) has not been operationalized, and thus no measure(s) currently exist. This has positioned the concept of cultural intelligence offered by Early and Ang (2003) as the predominant framework used in practice and research. The next two sections will focus on the development of the cultural intelligence tool as conceptualized by Early and Ang (2003).

Measurement development. There are various measurements used to assess cultural intelligence that include self- reports, observer reports, and test-based instruments (Ang, Rockstuhl, & Tan, 2015). Self-report measures of cultural intelligence assess responses to a series of statements or questions derived from some or all of the four cultural intelligence dimensions. Observer reports are used to assess cultural intelligence by capturing an individual’s external portrayal of cultural intelligence, or what is referred to as the participants “cultural intelligence reputation” (Ang, Rockstuhl, & Tan, 2015, p. 8). Cultural intelligence tests are used to measure an individual’s performance in a laboratory, or otherwise controlled settings. It is important to note that no one measure is likely to sufficiently capture a concept as complex as cultural intelligence (Thomas et al., 2008); consequently, in ideal situations different measures of cultural intelligence would be employed to get the most comprehensive results (Ang et al., 2015).

Although there are a number of self-report measures of various aspects of cultural intelligence, the Cultural Intelligence Scale is the most commonly used (Ang et al., 2015). Van Dyne et al. (2008) developed and validated the Cultural Intelligence Scale using a multistage approach to include scale development (Study 1), generalizability across samples (Study 2), generalizability across time (Study 3), generalizability across countries (Study 4), generalizability across methods (Study 5), and testing of discriminant and incremental validity (Study 6). The multistage study yielded a 20-item scale called the Cultural Intelligence Scale, which consists of four subscales that align with the original conceptual definitions (Van Dyne et al., 2008). Table 2 provides a synopsis of studies used to develop and validate the Cultural Intelligence Scale.

Table 2

Studies Used to Develop and Validate the Cultural Intelligence Scale

| Study | Method | Population/Sample | Results |
|--------------|--|---|---|
| 1 | Confirmatory factor analysis. | 576 business school undergraduate students in Singapore. | Composite reliability > 0.70; metacognitive 0.71, cognitive 0.85, motivational 0.75, behavioral 0.83. |
| 2 | Cross-validation using structural equation modeling. | 447 business school undergraduate students in Singapore (distinct from sample 1). | Supported results of Study 1; metacognitive 0.77, cognitive 0.84, motivational 0.77, behavioral 0.84. |
| 3 | Confirmatory factor analysis with an augmented covariance matrix as input. | 204 business school undergraduate students in Singapore (subset of sample 2). | Showed evidence of malleability of constructs and test-retest reliability. |
| 4 | Sequential tests of model invariance. | 337 undergraduate students from a large Midwestern U.S. school. | Showed the cultural intelligence 4-factor model holds across Singapore and the United States. |

Table 2 - continued

| Study | Method | Population/Sample | Results |
|-------|---|--|---|
| 5 | Observational method using multi-trait, multi-method (MTMM) to assess convergent and discriminant validity; hierarchical regression analysis. | 142 managers from an executive MBA program in a large U.S. university. | MTMM analysis demonstrated convergent, discriminant, and criterion validity across self and peer-related responses. |
| 6 | Discriminant validity (DV), confirmatory factor analysis (Study 6 data); incremental validity (IV), hierarchical regression; predictive validity (IV), hierarchical regression. | Matched data from 251 respondents from Study 2 and 249 respondents from Study 4. | DV: Supported distinctiveness of four cultural intelligence factors. IV: Predicts cultural judgment, decision making, adjustment, and mental well-being. PV: Four factors explained variance. |

Adapted from "Development and Validation of the CQS," by L. Van Dyne, S. Ang, and C. Koh, 2008, in S. Ang, & L. Van Dyne (Eds.), *Handbook of Cultural Intelligence. Theory, Measurement and Applications* (pp. 16-38), New York, NY: Routledge.

Cultural Intelligence in Higher Education

Higher education institutions have a unique opportunity and responsibility to prepare students for the increasingly globalized world (Smart & Csapo, 2003). The global flattening (Friedman, 2005) that has occurred over recent decades raises the stakes for adeptness in functioning in cross-cultural settings. Cultural intelligence has been presented as a framework and competency uniquely suited for cross-cultural interactions (Early & Ang, 2003; Rockstuhl et al., 2011). The balance of research thus far has examined aspects of cultural intelligence in international higher education settings (Ang et al., 2006; Rockstuhl et al, 2011; Soltani & Keyvanara, 2013). This is likely a function of two underlying premises of cultural intelligence. The first is its potential to improve cross-cultural interactions. An example is found in research by Harrison (2012) that explored the intercultural interactions among 755 students, both visiting and indigenous, in three universities in the United Kingdom. The study examined the student's

degree of ethnocentrism, cultural intelligence, and personality traits in relationship to cultural intelligence scores. The study found ethnocentrism and cultural intelligence to be negatively correlated as hypothesized; however, ethnocentrism showed modest correlation with the agreeableness and openness subscales of the Big Five. Other factors such as a multicultural upbringing, coupled with contact with people from diverse cultures showed a positive relationship with cultural intelligence and negatively with ethnocentrism. The same pattern was presented for high language ability and international orientation and cultural intelligence. It is further worth noting, gender was not shown to be a significant attribute. The findings were inconclusive in some aspects and signal the need for more research in this area.

Work by Soltani and Keyvanara (2013) likewise showed a scattered pattern of results but encouraged more investigation. The study employed a descriptive analytic study design to explore the relationship of cultural intelligence and social adaptability in Iranian and non-Iranian medical students in Isfahan, Iran. A sample of 441 (37 non-Iranian) students out of 2,500 were administered the cultural intelligence questionnaire developed by Earley and Ang (2004) and the California Social Adaptability Standard Questionnaire. The analysis showed a significant difference in mean scores for cultural intelligence among the two groups of students: Motivational (59% Iranian versus 43 % non-Iranian); Metacognitive (61.8% Iranian versus 47.6% non-Iranian), and Behavioral (31.8% Iranian versus 41.2% non-Iranian) subscales. There was also a significant difference in mean scores on the California Social Adaptability scale (68.9% Iranian versus 56.2% non-Iranian). There was no significant difference between the two groups on the cultural intelligence overall or the cultural intelligence Cognitive subscale.

Another important foundation of cultural intelligence is its performance as a state-based attribute, thus indicating it can be enhanced (Ang et al., 2006). A primary means of enhancing

cultural intelligence is by international education and work experiences (Crowne, 2008; Early, 2002); however, there is also research indicating cultural intelligence can be enhanced through structured interventions. For example, MacNab and Worthley (2012) explored the viability of a cultural intelligence education program. The researchers investigated the relationship between cultural intelligence-Motivational, Behavioral, and Metacognitive dimensions against individual attributes such as international travel, work experience, management experience, and self-efficacy. The cultural intelligence constructs were combined to form the learning cultural intelligence model. The study included an intentionally multicultural group of 370 student trainees from experiential-based cultural intelligence education programs in the United States and Australia. Control variables included age, gender, and undergraduate versus postgraduate status. Results showed a significant relationship between self-efficacy and learning cultural intelligence totals and each of the learning cultural intelligence subscales, which suggested self-efficacy plays a role in cultural intelligence education and development programs. No significant relationship existed between international travel experience, work and management experience, and the cultural intelligence development program.

The aforementioned studies demonstrate the viability of cultural intelligence as a framework for understanding and shaping cross-cultural interaction in a higher education context among undergraduate and graduate students. Cultural intelligence demonstrated an explanatory capacity in situations that involved cross-cultural interactions and was shown to be responsive to training interventions. The next section examines potential implications of cultural intelligence in fostering teamwork among students in the health sciences.

Implications for Cultural Intelligence in the Health Sciences

Diversity continues to be an important, and yet vexing, issue within the healthcare arena (Sullivan & Mittman, 2010; Nivet, 2011, McDermont, 2013). Diversity is also important to the education process as well as it plays a role in helping to shape and influence collaborative learning teams (Purden, 2005: Shaw, E. J., 2005). Demographic attributes such as race and ethnicity, and gender are primary factors that can influence the dynamics in collaborative learning environments (Gallegos & Peeters, 2011). However, health profession programs continue to struggle with the issue of diversity. The fundamental challenge facing programs is linked to the continued paucity of students enrolling in health profession programs from minority and other historically underrepresented backgrounds. The issue surfaces in the formative undergraduate college years as minority students experience achievement gaps in gateway courses that are used by health professions programs to evaluate the likelihood of student successfully navigating the curriculum (Alexander, Chen, & Grumbach, 2009). The challenge persists as indicated in a recent report by the Association of American Medical Colleges (2015) highlighting that 515 black males enrolled in medical school in 2014, which trailed the number of black males (542) admitted in 1978. Health profession programs that lack students from a diverse range of cultural and social backgrounds compromises the overall quality of education and can potentially negatively impact patient outcomes (Sullivan, 2004).

However, the mere presence of demographic and cultural diversity within a health education or clinical practice environment is only part of the equation. In order to provide effective care, the healthcare workforce will need requisite levels of cultural competency, which facilitates the delivery of care that “respond(s) effectively to the needs of patients and families from racially, ethnically, culturally, and linguistically diverse groups” (Purden, 2005, pp. 226-

227). Cultural intelligence is offered as a concept that specifically addresses dynamics that are inherent in social interactions among individuals from diverse backgrounds (Early and Mosakowski, 2000; Rockstuhl and Ng, 2008). With respect to its role in developing cultural competency, individuals with high levels of cultural intelligence have shown greater adaptive behaviors in cross-cultural interactions (Rose, Ramalu, & Uli, 2010). Further, poor communication among health professionals is a primary barrier to delivering culturally competent care (Bentacourt, Green, & Carrillo, 2002). Groups that exhibit a high level of collective cultural intelligence have been found to more effectively address difficulties that emerge and coming to decisions that advances the group's agenda (Silberstang & London, 2009). In addition, teams consisting of culturally diverse members that have high average cultural intelligence have shown higher levels of member cohesion (Ang et al., 2015).

In summary, cultural intelligence has received broad appeal in a variety of contexts, and has been examined in more than 40 countries (Ang et al., 2015). Cultural intelligence, while germinating within a business context, has broad applications across higher education and health profession education environments. In particular, understanding the impact of cultural intelligence on diverse groups of health profession students can potentially influence the future delivery of culturally competent care to patients. The following section provides a synopsis of what is currently understood about the relationships between emotional intelligence, cultural intelligence, and team-based learning.

Intersecting Emotional Intelligence, Cultural Intelligence, and Team-Based Learning

Based on a review of the existing literature, there is no research linking the three primary study variables: emotional intelligence, cultural intelligence, and team-based learning; however,

there is research that highlights important intersections among these concepts. This section will expand on the established association between emotional intelligence and cultural intelligence within the social intelligence space (Crowne, 2007) and at the subfactor level (Moon, 2010). The section also discusses the role of diversity with respect to team-based learning (Michaelsen & Sweet, 2011), and implications for both emotional intelligence and cultural intelligence. The section concludes with a review of research highlighting the important relationship between personality factors with emotional intelligence and cultural intelligence.

Emotional Intelligence and Cultural Intelligence

As alluded to previously, the research by Crowne (2007, 2009) connects emotional intelligence and cultural intelligence in the social intelligence space. Crowne (2013), building on earlier research, examined the relationship of emotional intelligence and cultural intelligence with respect to how the variables are influenced by cultural exposure. The study was conducted using a sample of 485 students from a northeastern university in the United States. Findings showed that cultural exposure influenced levels of cultural intelligence while having no impact on emotional intelligence. The finding aligns with research by Ang et al. (2015) that asserts cultural intelligence has specific usefulness in interpreting and functioning in cross-cultural interactions. However, more research is warranted as research to the contrary has indicated emotional competency is positively influenced by engagement in cross-cultural interactions (Fatt & Howe, 2003).

Moon (2010) conducted the most intensive investigation of emotional and cultural intelligence. The study advanced the understanding of the relationship between emotional intelligence and cultural intelligence in a population of 381 undergraduate and graduate students from a large Korean university. The study affirmed the assertion by Crowne (2007) that

emotional intelligence and cultural intelligence are distinct constructs with intersections among certain sub-factors. Specifically, the analysis found discriminant validity with emotional intelligence and the 4-factor cultural intelligence model at the global level. At the subfactor level, Moon (2010) found relationships between the social competence dimensions of emotional intelligence (social awareness and relationship management) with the Metacognitive and Behavioral dimensions of cultural intelligence.

Work by Crowne (2007, 2009, 2013) establishes emotional intelligence and cultural intelligence in the realm of social intelligence. Moon (2010) illuminated the relationship between emotional intelligence and cultural intelligence confirming the idea that the two concepts are distinct with interrelated elements. The next two sections highlight the convergence of each of the primary concepts with diversity and personality.

Diversity Matters

Diversity serves as a thematic underpinning that connects the three primary study variables. A central feature of team-based learning is the assembly of students in small learning groups based on the broadest representation of selection factors possible to include demographic variables. The seminal work by Michaelsen and Sweet (2008) on team-based learning asserts that “in order for groups to function as effectively as possible, they should be as diverse as possible” (p. 10). They recommend that faculty heavily factor in a broad array of demographic variables such as race, ethnicity, gender, and personality profiles in the formation of teams (Michaelsen & Sweet, 2008). The intended role for diversity in the team-based learning context is to enrich and expand the pool of ideas as students engage the active learning process. This is also consistent with research in higher education that indicates compositional diversity, an

inclusive curriculum, and opportunities for informal interactions that enhance the learning experiences and educational outcomes for students (Gurin, 2012).

The natural extension of this discussion is to consider what aspects of a student's make-up can or should be factored into the diversity interest of team-based learning. Clarke (2010a) suggested that emotional intelligence is a personal attribute worth exploring in the context of team-based learning. Cultural intelligence, while not referenced directly in the team-based learning literature, is constructed to be an ally in fostering effective team performance. The value of having a culturally intelligent group of students is linked to the assertion by Michaelsen and Sweet (2008) that students will gain better teamwork skills through participation in team-based learning experiences. This is expected to occur with no specific or added instructions provided to students or particular expertise of instructors in team-based pedagogy (Parmelee, Michaelsen, Cook, & Hudes, 2012).

Diversity represents a broad array of human attributes and is inclusive of personality as one of its expressions. "When team members must collaborate and make extensive mutual adjustments to their thoughts and actions, personality traits become more noticeable and become more salient" (Molleman, 2005, p.187). As such, personality concepts provide another important area of convergence with emotional intelligence and cultural intelligence.

Personality Matters

Emotional intelligence and personality. There is an ongoing debate with respect to emotional intelligence and personality constructs. The debate centers largely on whether there is incremental predictive validity of emotional intelligence above personality (Schulte, Ree, & Carretta, 2004; Bastian, Burns, & Nettelbeck, 2005; Petrides, Pita, & Kokkinaki, 2007; Andi, 2012) remain unanswered as the literature continues to provide mixed results. Research in

pursuit of some resolution of the matter is dependent upon which model of emotional intelligence is under investigation. There is substantive research demonstrating that tools accessing the ability model lack strong association with both personality and cognitive intelligence constructs (Murphy, 2006). This dynamic is illustrated in a study by Lopes, Salovey, & Straus (2003) conducted to determine the construct validity of emotional intelligence in relationship to emotional intelligence, verbal ability, personality traits, and satisfaction with their social network. The sample included 103 students enrolled in an introductory psychology course. The primary instruments used included: the MSCEIT and Trait Meta-Mood Scale (emotional intelligence), Wechsler Adult Intelligence Scale (verbal intelligence), NEO Five Factor Inventory (Big Five personality factors⁹), a self-designed scale to measure self-perceived social skills, and the Crowne and Marlowe Social Desirability Scale. Findings demonstrated a modest relationship between the MSCEIT and Big Five personality factors and with verbal intelligence. In comparing emotional intelligence and Big Five factors, the highest correlations occurred with Managing emotions and Agreeableness (.33) and between the MSCIET total score and Agreeableness (.32).

Another study using the MSCIET and the Big Five to explore the discriminate validity of emotional intelligence had similar findings. Day and Carroll (2003) examined the predictive

⁹ Big Five Trait Taxonomy (Big Five Personality Factors). A taxonomy of personality traits, often referred to as the Big Five (John, Naumann, & Soto, 2008, p. 116). John et al. (2008) claim that the Big Five represents a broader labeling that further consists of a subset of personality traits that include: 1) Extraversion, which reflects a level of energy in how one interfaces with the social and physical aspects of their surroundings. Inclusive of traits such as assertiveness, positive emotional expression, and sociability; 2) Agreeableness, which reflects a “prosocial and communal orientation” that includes traits such as modesty, altruism, and trust (John et al., 2008, p. 120); 3) Conscientiousness that is described as “socially prescribed impulse control [italics removed] that facilitates task- and goal-directed behavior” (John et al., 2008, p. 120). It includes traits such as delayed gratification, planning, organizing, and prioritization; 4) Neuroticism, which “contrasts emotional stability and even-temperedness with negative emotionality” (John et al., 2008, p. 120) such as nervousness, anxiety, and tension; and, 5) Openness, which reflects the “breadth, depth, originality, and complexity of an individual’s mental and experiential life” (John et al., 2008, p. 120).

ability of emotional intelligence on individual performance, group performance, and group citizenship behaviors. The findings with respect to the discriminant validity of emotional intelligence demonstrated a modest to non-significant relationship with the Big Five. Findings at the subfactor level showed varied associations: agreeableness related to emotion management ($r = .16$); Openness was related to each of the MSCEIT subfactors with r 's ranging from .13 to .23; Extraversion was related to emotional understanding and integration with r 's of -.15 and -.11, respectively; Neuroticism was related to emotional perception ($r = .11$); and Conscientiousness had no relationship to either of the four MSCEIT subfactors. Further, a study by Roberts, Schulze, and MacCann (2008) also supported previous findings with the MSCEIT shown to be generally distinct from the Big Five with a moderate correlation ($r = .22$) with Agreeableness.

The association between emotional intelligence and personality has also been examined in a health sciences context. Brannick et al. (2009) investigated the convergent and discriminant validity of the MSCEIT (ability model) and WLEIS (trait model) emotional intelligence measurements among first and second-year U.S. medical students. The NEO-PI-R was used to assess the Big Five personality construct. The study demonstrated the measures did not assess the same qualities nor were they highly correlated; however, the global WLEIS score was more highly correlated to each of the NEO-PI-R personality factors. The NEO-PI-R accounted for 45% of variance in the WLEIS. The NEO-PI-R accounted for only .09% of variance of the MSCEIT (Brannick et al., 2009, p.1066).

Conversely, trait emotional intelligence is conceptually constructed within the personality space (Petrides, Pita, & Kokkinaki, 2007). At the center of the trait emotional intelligence and personality discourse is a contention that there is a lack of discriminant and incremental validity essentially rendering it “indistinguishable” from prominent personality constructs (Petrides et al.,

2004, p. 576). Should this be the case, there are major implications in an applied context. Petrides et al. (2007a) address this issue in a comprehensive examination of trait emotional intelligence in relationship to the Giant Three (Eysenckian model) and Big Five personality constructs. There were six criterion variables targeted to include: (a) life satisfaction; (b) emotion control; and (c) four distinct coping styles: rational coping, detached coping, emotional coping, and avoidant coping. The study was conducted in two parts using a sample of 274 students. The first part consisted of the team running two joint factor analyses to understand the positioning to trait emotional intelligence within the Giant Three and Big Five. The second step involved running six 2-step hierarchical regressions to explore the predictive ability of trait emotional intelligence over the Giant Three and Big Five. The results from part one indicated trait emotional intelligence is partially influenced by several personality factors found in the lower levels of the Giant Three and Big Five. Part two of the study demonstrated trait emotional intelligence has incremental validity over the Giant Three and the Big Five.

Cultural intelligence and personality. Cultural intelligence has also been found to show discriminant validity with associations with Big Five at the subfactor levels. As referenced in Harrison (2012), personality was one of the areas examined, which demonstrated significant association among various sub-factors of the Big Five. However, the relationship is thought to go further. Research indicates significant intersections with personality influences, how a diverse cultural setting is interpreted, and how cultural intelligence functions in those settings (Sahin, Gurbuz, & Koksai, 2014). A case in point, Early and Ang (2003) submits that personality is an “antecedent or causal agent” (p.160) to cultural intelligence. In making the argument, the researchers introduce the concepts of trait (personality) and state (cultural

intelligence), qualities that are distinguished by the malleability of the latter to change or improve with training (Ang, Dyne, & Koh, 2006).

Ang et al. (2006) took a deeper look at cultural intelligence and the Big Five focusing on relationships among respective subfactors. The study examined the relationship between cultural intelligence and the Big Five within a sample of undergraduate business students in a public university in Singapore. The study found significant correlations between multiple dimensions of cultural intelligence and factors of the Big Five that include: (a) metacognitive cultural intelligence and conscientiousness; (b) behavioral cultural intelligence and agreeableness and emotional stability; and (c) cognitive, motivational, and behavioral cultural intelligence and extraversion. Of note, the openness factor of the Big Five demonstrated significant correlation with all four cultural intelligence dimensions. However, Early and Ang (2003) concede that personality likely functions as a moderator with respect to personality dimensions. The researchers base this claim on research (Ones & Viswesvaran, 1997; Caligiuri, 2000) that examined the influence of Big Five and cultural intelligence on individuals participating in global work assignments and found personality to have some influence but to be largely insufficient as the sole predictor in those settings (Early & Ang, 2003). The researchers characterize the importance of cultural intelligence as enhancing how one adjusts and performs tasks in global work assignments in addition to an individual's personality profile (Early & Ang, 2003).

Chapter Summary

As team-based learning emerges as a popular teaching pedagogy within the health sciences, there are direct implications for the preparation of students for team-based learning environments prior to their enrollment in health profession education programs. Previous

sections have demonstrated the relationship between team-based learning and emotional intelligence (Clarke, N, 2010a; 2010b). In addition, emotional intelligence and cultural intelligence were shown to interrelate in the social intelligence space (Crowne, 2007; 2009) and at the subfactor level (Moon, 2009). The first area is with respect to diversity and the personal demographic attributes such as race, gender, socioeconomic status, that each individual adds to a group setting. The inclusion of the broadest array of personal attributes is encouraged in the formation of learning teams (Michaelsen & Sweet, 2008). Demographic variables such as race, gender, and age have also been associated with emotional intelligence indicating females tend to exhibit higher emotional intelligence than males, as one ages, emotional intelligence tends to increase, and individuals from minority groups had higher levels of emotional intelligence than non-minorities (Van Rooy et al., 2005). There are also inherent connections between diversity and cultural intelligence as the cornerstone of the concept is its unique ability to enhance individual and group performance in cross-cultural interaction (Early & Ang, 2003).

Second, the role and importance of personality is also a common thread among the three primary variables of interest. The relationship between cultural intelligence and personality is less contentious than the relationship with emotional intelligence; however, there are associations among the dimensions of each concept, particularly with regard to Openness from the Big Five and each of the cultural intelligence dimensions (Ang et al., 2006). In all, these interconnections present an opportunity for deeper and more informed research and application within the sphere of interprofessional education. The section that follows highlights gaps in the literature that will serve as a guide to conducting analysis of the relationship between emotional intelligence, cultural intelligence, and team-based learning.

Gaps in the Literature

The literature review provided an overview of the importance of team-based learning to achieving the educational, and to a larger extent, clinical practice aspirations of interprofessional education. Research supports the importance of developing a positive attitude among health profession students towards teamwork as a vehicle to improving the learning process and ultimately patient care. Research also demonstrates there are headwinds that health profession institutions must contend with in successfully implementing interprofessional education models that include overcoming institutional barriers and surmounting the influence of professional identity. Notwithstanding, there are omissions in the extant literature with regard to at least two important questions: 1) What factors influence the development of positive attitudes towards teamwork in health profession students and how these students function in teams?; and, 2) At what stage do those factors get addressed in the preparation and education experience of those same students?

With respect to factors that may shape student attitudes, current research on team-based learning highlights the importance of creating diverse learning teams based on demographic attributes such as race, gender, and personality (Michaelsen et al., 2008). There is research examining the role of emotional intelligence in team-based learning (Clarke, 2010a and 2010b); however, the focus is on how emotional intelligence is influenced by participation in team activities. Research examining emotional intelligence as a quality students bring to the table that influence attitudes and behaviors in team-based experiences is absent from the literature.

In terms of team performance, the team-based learning framework emphasizes the critical importance of sustaining effective student engagement across a diverse set of academic, personal, and social dimensions of team members. Cultural intelligence is put forward to be

uniquely relevant to enhancing social interactions among groups, particularly in cross-cultural situations. Individuals with high cultural intelligence, particularly higher metacognitive cultural intelligence, are more inclined to trust other individuals from a different culture. This dynamic is amplified if other individuals in the intercultural setting are exhibiting high levels of behavioral cultural intelligence (Ang, Rockstuhl, & Tan, 2015). There is research indicating a strong relationship between emotional intelligence and cultural intelligence within the social intelligence space. In fact, it is recommended that these two concepts are paired together when examining social dynamics in cross-cultural settings (Crowne, 2009); however, there is very limited research linking the two concepts in a higher education setting and no research examining the two concepts together in health professions settings.

Regarding the question of when to introduce interprofessional education and teamwork concepts, the literature provides emphatic support for introducing the concepts in the early stages of a student's experience (Anderson & Thorpe, 2008; Coster et al., 2008; Dumke et al., 2016; Hoffman & Harnish, 2007; Michaelsen et al., 2008; Parmelee et al., 2009; Williams et al., 2012); however, research to date focuses largely on introducing interprofessional education among health profession students enrolled in degree-granting education programs (Coster et al., 2008; Crossley & Vivekananda-Schmidt, 2009; Forte & Fowler, 2009; Mitchell et al., 2011; Rose et al., 2009).

There is an emerging body of research exploring the concept of teamwork in pre-health student populations; however, the focus is on whether exposure to interprofessional education is viable within this group (Hoffman & Harnish, 2007), influences attitudes, or has a disparate impact on certain disciplines (Dumke et al, 2016), or whether team-based learning improves educational outcomes (Engle, 2008; Garrett, 2008; Hockings, DeAngelis, & Frey, 2008). There

appears to be no research exploring underlying factors that influence how pre-health students view interprofessional education or team-based learning. Based on these evident gaps, and in consideration of the importance of teamwork in health professions education and healthcare, the current study will investigate the relationship between emotional intelligence and cultural intelligence with team-based learning in a pre-health profession student setting.

CHAPTER 3. RESEARCH DESIGN AND METHODOLOGY

“Today collaborative teamwork is no longer an option: it is a basic pre-requisite for effective practice and quality care” (McCallin & McCallin, 2009, p. 61). With the emergence of interprofessional education in the health professions, “[c]ollaborative teamwork is a strategy for action that supports interprofessional working” (McCallin & McCallin, 2009, p. 65). In spite of this strong appeal for collaboration, there is emerging (but still limited) research on individual factors that are germane to successfully learning in team-based settings. Therefore, this study investigates the relationship between emotional intelligence and cultural intelligence to team-based learning. Both emotional intelligence and cultural intelligence are associated with social intelligence, which is an important quality in settings that rely on effective “social interactions” (Crowne, 2006, p. 151). It is intended that this study will inform the discourse on preparing pre-health profession students for success in interprofessional education and practice.

Research Questions

The research questions below guide this study in examining the relationship between emotional intelligence and cultural intelligence to team-based learning.

1. What is the relationship between emotional intelligence and attitudes towards team-based learning among undergraduate pre-health profession students?
2. What is the relationship between cultural intelligence and attitudes towards team-based learning among undergraduate pre-health profession students?

3. What degree of variance in attitudes towards team-based learning is predicted by emotional intelligence and cultural intelligence, beyond the Big Five personality factors?

Hypotheses

The hypotheses investigated in this study were:

Emotional Intelligence

H1_a: There is a relationship between global trait emotional intelligence and attitudes towards team-based learning.

H1_b: There is a relationship between subfactors of trait emotional intelligence (i.e., Emotionality, Self-control, Sociability, and Well-being) and attitudes towards team-based learning.

Cultural Intelligence

H2_a: There is a relationship between cultural intelligence and attitudes towards team-based learning.

H2_b: There is a relationship between the four dimensions of cultural intelligence (i.e., Metacognitive, Cognitive, Motivational, and Behavioral) and attitudes towards team-based learning.

Variance Associated with Emotional and Cultural Intelligence

H3: A significant degree of variance in attitudes towards team-based learning will be predicted by emotional intelligence and cultural intelligence above and beyond the Big Five personality factors.

Research Design

This study uses a quantitative, non-experimental, cross-sectional study design. The study is exploratory and employs correlational and multivariate regression analysis techniques. The

relationship between the independent variables of emotional intelligence and cultural intelligence has been examined in previous research (Crowne, 2009; Moon, 2010). There is independent research that suggests emotional intelligence (Borges, Kirkham, Deardorff, & Moore, 2012; Clarke, 2010b) and cultural intelligence (Ang et al., 2011) can play an important role in group settings such as are found in the use of team-based learning approaches.

The time dimension for this study is cross-sectional as measures of key variables will be collected at one point in time (Vogt & Johnson, 2011). The measure of the dependent variable team-based learning and independent variables emotional intelligence and cultural intelligence will be taken during a single point during the academic year. Cross-sectional studies do not show causation but are useful in establishing an exploratory framework such as the aim of this study (Leedy & Ormrod, 2005). The use of a cross-sectional design to examine the dependent and independent variables is consistent with the literature: emotional intelligence (Parker et al., 2004; Suliman, 2010; Wessel et al., 2008) and cultural intelligence (Ang et al., 2006; MacNab & Worthley, 2012; Rockstuhl, 2011).

A within-subjects approach is used to examine the hypotheses. The study is non-experimental as there is no manipulation of the independent variables emotional intelligence/emotional quotient and cultural intelligence, nor is there random or equivalent assignment of subjects to groups. There are advantages and disadvantages inherent in the selection of any research design (Leedy & Ormrod, 2005). The most significant drawback of the non-experimental approach used in this study is its inability to infer causality (Polit & Hungler, 1999).

Population and Sampling

Population

The target population for this study is undergraduate pre-health profession students at a large, mid-Atlantic public research university (mid-Atlantic University). The sample frame consists of university assigned e-mails for students with freshman or sophomore academic classification, enrolled in fall of the 2016 academic year, and identified as a pre-health or pre-professional student in the university records system. An *a priori* power analysis using G*Power Version 3.1.9.2. (G*Power) online software tool (Faul, Lang, & Buchner, 2007) was used to determine the requisite sample size for analysis. The parameters used in determining sample size include a moderate effect size of .35, 95% confidence level, .05 significance, and .80 power.

The mid-Atlantic University spans two campuses: a main campus and a health sciences campus. The university has a total enrollment of over 31,000 full and part-time students with approximately 4,200 enrolled in health sciences programs. The health sciences campus is comprised of the schools of Allied Health Professions, Dentistry, Medicine, Nursing and Pharmacy.

According to mid-Atlantic University's *2016-2017 Common Data Set*, the total number of enrolled undergraduate students was 24,212. There was a total of 14,221 women and 9,991 men identified as either full or part-time enrollees. There were 4,234 total first-year, first-time undergraduate students enrolled in fall 2016. Of that number 1,575 (37.2%) were men and 2,659 (62.8%) were women.

The students represented a diverse range of backgrounds, particularly with respect to their racial/ethnic identity. Table 3 delineates the demographic profile for degree-seeking and non-degree seeking students.

Table 3

First-time, First-Year Enrollment by Racial/Ethnic Category,
2016-2017

| Racial/ethnic category | Degree-seeking undergraduates (first-time, first-year enrollment) | % of Population |
|---|--|----------------------------|
| Nonresident alien | 114 | 2.7% |
| Hispanic/Latino | 381 | 9% |
| Black or African American, non-Hispanic | 838 | 19.8% |
| White, non-Hispanic | 1,870 | 44.2% |
| American Indian or Alaskan Native, non-Hispanic | 10 | <1% |
| Asian, non-Hispanic | 598 | 14.1% |
| Native Hawaiian or Pacific Islander, non-Hispanic | 3 | <1% |
| Two or more races, non-Hispanic | 280 | 6.6% |
| Race unknown | 140 | 3.3% |
| Total | 4,234 | 100% |

Note. Percent total not exactly equal to 100% due to rounding

Pre-health Profession Student Profile

The mid-Atlantic University hosts an Office of Pre-health Advising (Advising Office) that provides career advising and other support resources to students interested in pursuing a health professions career. Interested students register with the Advising Office and are placed within one of two advising tracks based on their self-selected health profession interest. Those tracks include a pre-health track and a pre-professional track. The pre-health track consists of students interested in careers such as clinical lab sciences, radiation sciences, and dental hygiene. The pre-professional track consists of student interested in careers such as dentistry, medicine, or pharmacy (both tracks will be referred from hereon as pre-health track).

According to the census¹⁰ there were 2,624 students enrolled in a pre-health track. The racial and ethnic breakdown included: 4 American Indian/Alaskan (.15%); 735 Asian (28.01%);

¹⁰ Source: Office of Planning and Decision Support, July 2017.

548 Black/African American (20.88%); 222 Hispanic/Latino (8.46%); and, 859 students identified as White (32.74%). Additionally, 58 students were identified as International (2.21%); 159 reported two or more races (6.06%); and, 39 students were reported as unknown (1.49%). The profile for gender included 1,831 students identified as female (69.78%); 792 as male (30.18%); and, 1 as Other (<.1%). Students reported their age as follows: 2,392 students 18-21 years of age (91%); and 173 students 22 years of age or older (9%). With respect to health profession interest, the majority of students were in the pre-medicine track, 1,283 (49%). The remaining pre-health tracks included: 393 in the pre-Allied Health track (15%); 224 in the pre-Dentistry track (9%); 405 in the pre-Nursing track (15%); 214 in the pre-Pharmacy track (8%); and, 105 students had other health career interests (4%).

A single sampling site was chosen to avoid complexities that would exist in using a student population from multiple universities. Pre-health advising programs are implemented in a variety of formats across different universities. It would be significantly challenging to design an analysis that accounts for this multitude of advising formats. This choice poses a threat to ecological validity in that the generalizability to other college or university environments is diminished (Vogt & Johnson, 2011). However, while there is variability across universities there are facets of this study that would be generalizable at the student level. For example, standards for applying to health profession schools are relatively common and are a reflection of requirements from national accreditation bodies (Elam, Seaver, Berres, & Brandt, 2002; Gross, Mommaerts, Earl, & De Vries, 2008). By extension, this creates a commonality among universities in terms of the types and content of preparatory courses as well as the types of resources established to assist students seeking a health profession career.

Sampling

Nonprobability purposive sampling was used in this study. Previous research has used nonprobability sampling methods to examine the independent variables emotional intelligence (Benson et al., 2010; Carr, 2009; Parker et al., 2004) and cultural intelligence (Earley & Ang, 2003; MacNab & Worthley, 2012; Silberstang & London, 2009). A purposive sample is “composed of subjects selected deliberately by researchers usually because they think certain characteristics are typical or representative of the population” (Vogt & Johnson, 2011, p. 310). As it pertains to this study, program participants share a common characteristic of being interested in pursuing a health professions career. Purposive sampling was also chosen for its convenience. An advantage of purposive sampling is that it creates a familiarity with the subjects that may aid in identifying influences of other variables (Salter, Evans, & Forney, 2006).

Instrumentation and Source of Student Data

This study investigated the relationship between one dependent variable (i.e., attitudes toward team-based learning) and two independent variables (i.e., emotional intelligence and cultural intelligence). The analysis factored in control variables (or covariates) whose influence on the primary variables are supported in the literature. Figure 3 shows the instruments and relationships among study variables. The conceptual and operational definitions of the dependent variable, independent variables, and control variables are delineated below.

Dependent Variable

The dependent variable for this study is attitudes towards team-based learning and is defined as “student perceptions of the value of learning in teams” (Levine et al., 2004, p.272). Based on literature focused on team-based learning in a health sciences education setting, the dependent variable is operationalized using the Value of Group Work subscale of the Value of

Teams Survey. Levine et al. (2004) developed the Value of Teams Survey as a 17-item scale with two subscales measuring “student’s perceptions of the value working in teams” (p. 272). The Value of Teams Survey uses a 5-point rating scale ranging from *Strongly Agree* to *Strongly Disagree*, with scores ranging from 6 to 30 (McMullin, Cartledge, Levine, & Iversen, 2013). A higher score indicates a greater perceived value placed on working in group settings or with one or more peers (Levine et al., 2004). Levine et al. (2004) reported an internal consistency of .81 for the total Value of Teams Survey in a sample of 20 students participating in a psychiatry clerkship rotation. Work by Clark et al. (2008), employing a two-part study design among nursing students reported internal consistencies for the total Value of Teams Survey of .92 and .87, respectively (Clark et al., 2008).

The Value of Group Work subscale consists of six items and measures the value students place on working in groups. Sample items from the Value of Group Work subscale include, “Solving problems in a group is an effective way to practice what I have learned.” and “Group decisions are often better than individual decisions.” (Espey, 2010, p.32). The Value of Group Work had a .53 internal consistency in the study by Levine et al. (2004). In a later work by Cheng et al. (2014), the internal consistency for the Value of Group Work was .79 in a sample of 399 undergraduate nursing students.

The second Value of Teams Survey subscale is labeled Working with Peers, which measures the value students place on working with their peers (Levine et al., 2004). The Working with Peers subscale consists of six items with an internal consistency of .81 (Levine et al., 2004). There are an additional five items in the Value of Teams Survey that according to P. Kelly¹¹ (personal communication, December 14, 2016), focus on individual skills and are not

¹¹ P. Kelly (P. Adam Kelly, PhD, MBA) is a Research Health Scientist, at the Southeast Louisiana Veterans Health Care System and Adjunct Associate Professor, Tulane University School of Medicine. Dr. Kelly served as a researcher

included in the analysis of the VWG and WP subscales. The Value of Group Work subscale was selected as it best aligns with the theoretical framework of this study, which seeks to understand the attitudes students have towards working in group-based settings (or teams). Conversely, the Working with Peers subscale captures student attitudes towards working in various learning settings (e.g., tutoring) that consist of one or more of their peers (P. Kelly, personal communication, December 14, 2016).

Independent Variables

The primary independent variables for this study are *emotional intelligence* and *cultural intelligence*. The emotional intelligence and cultural intelligence measures are further defined below, in addition to other independent variables reflecting demographic domains that have been shown to be of influence on emotional intelligence, cultural intelligence, team-based learning, or the experience of college student populations generally.

Emotional Intelligence. The trait emotional intelligence model will be used in this study as provided by Petrides (2010) and defined as “a constellation of emotional self-perceptions located at the lower levels of personality hierarchies” (p. 137). Trait emotional intelligence is operationalized using the Trait Emotional Intelligence Questionnaire-Short Form (TEIQue-SF). The TEIQue-SF is a 30-item self-report questionnaire patterned after the full version of the TEIQue, which consists of four factors (well-being, self-control, emotionality, and sociability) that are comprised of 15 sub-factors referred to as facets (Parker, Keefer, & Wood, 2011). The TEIQue-SF was constructed by selecting two items from each of the 15 facets based on “item-total correlations and representative coverage of the facet-level content” (Parker et al., 2011, p.

in the development of the Value of Teams Survey. Dr. Kelly was referred to the researcher in personal communication on December 14, 2016 with Dr. Ruth E. Levine, who was listed as the corresponding author in Levine et al, 2004.

764). The TEIQue-SF uses a 7-point Likert scale to measure items (Cooper & Petrides, 2010) and provides a global trait emotional intelligence score and scores for each of the four factors (Petrides & Furnham, 2006). The four subscale scores are created using 26 of the 30 items.¹² The remaining four items contribute to the global score only and are associated with individual factors: self-motivation and adaptability (Siegling, Vesely, Petrides, & Saklofske, 2015).

Sample questions from the TEIQue include: “I can deal effectively with people,” and “I’m generally aware of my emotions as I experience them” (Cooper & Petrides, 2010, p. 454). The TEIQue-SF global score has shown high reliability at .87 alpha (Petrides et al., 2010). Low internal consistency (.69) has been found at the factor level in relation to the full instrument (Parker et al., 2011).

Cooper and Petrides (2010) recommend the TEIQue-SF for use when a quick method of assessing emotional intelligence is warranted. It is recommended that the full version be used if factor level assessment is of great importance in analysis (Parker et al., 2011). In support of this suggestion, Cooper and Petrides (2010) provided validation of the TEIQue-SF utilizing item-response theory to conduct two separate studies: the first among a sample of 1,119 individuals, and the second among a sample of 866 individuals. The participants were from college campuses and the general public. Both studies concluded that there was validity at the latent trait range, with the exception of one item in each response (Cooper & Petrides, 2010). Internal consistency reliabilities for the TEIQue-SF global trait scores were .88 and .89 for the respective studies. The reported reliabilities were consistent with the .87 internal consistency reliability reported for the full version of the TEIQue reported in Petrides et al. (2010).

¹² The 26 items comprising the four TEIQue-SF subscales are found at <http://www.psychometriclab.com/Home/Default/14>.

Cultural Intelligence. The second primary independent variable is cultural intelligence. The definition of cultural intelligence by Earley and Ang (2003) is used for this study, which states that cultural intelligence is a “person’s capability for successful adaptation to new cultural settings, that is, for unfamiliar settings attributable to cultural context” (p. 9). Cultural intelligence is operationalized using the Cultural Intelligence Scale (CQS) as described below.

Van Dyne et al. (2008) developed the CQS as a 20-item, 4-factor measure with 576 undergraduate business school students in a university in Singapore. The four subscales include: Metacognitive cultural intelligence; Cognitive cultural intelligence, Motivational cultural intelligence, and Behavioral cultural intelligence (defined in Chapter 2). Items are scored using a 7-point Likert scale ranging from *strongly disagree* (1) to *strongly agree* (7). The CQS has an average reported factor rating of 0.79 across the four scales (Ang et al., 2006). Sample items include: metacognitive cultural intelligence, “I am conscious of the cultural knowledge I apply to cross-cultural interactions”; and motivational cultural intelligence, “I am sure I can deal with the stresses of adjusting to a culture that is new to me” (Van Dyne et al., 2008, p. 20).

Personality. Additional independent variables for analysis include the Big Five personality factors, demographic variables to include: race/ethnicity, gender, age, first-generation status, socioeconomic status, academic classification, and pre-health profession designation. The Big Five personality factors will be operationalized using the Big Five Inventory. This is a 44-item instrument measuring the Big Five personality factors consisting of neuroticism, extraversion, openness, agreeableness, and conscientiousness. Items are scored using a 5-point Likert scale ranging from *disagree strongly* to *agree strongly*. The Big Five Inventory has been found to have moderate to high internal consistency reliability (alpha range = .79 to .88; median

.82). Sample items include: conscientiousness, “Does a thorough job” (positive orientation), or “Can be somewhat careless” (reverse item) (John & Srivastava, 1999; Peterson, 2006).

Demographic (control variables). The following demographic variables will be measured as follows: (a) race/ethnicity will be measured as American Indian or Alaskan Native, Asian or Pacific Islander, Black or African-American, White/Caucasian, Hispanic, Multiple Race/Ethnicity, and other; (b) gender will be categorized as male, female, or other; (c) age will be measured in whole years; (d) first generation status is conceptually defined as students whose parents or legal guardians who have less than a high school education, and will be operationalized as a single question inquiring about the education status of the biological mother and father or legal guardian (Nunez & Cuccaro-Alamin, 1998), “Has either of your biological parents or legal guardians attained at least a four-year college degree prior to you enrolling in a college?”. The available responses will be Yes, No, Not sure; (e) Pre-health profession designation is the self-identified health profession program of interest to an undergraduate pre-health student. The options will include Allied Health Professions, Dentistry, Medicine, Nursing, Pharmacy, Other healthcare career interest, Not interested in a health career, and Prefer not to answer. Worth noting, there is a debate with regard to how early in an educational experience a student develops a professional identity. The inclusion of professional identity as a control variable is based on research demonstrating students in the pre-health phase of their educational experience may adopt attitudes that are typically associated with students who have a more mature professional identity (Hoffman & Harnish, 2007).

A description of the variables of interest and their corresponding level of measurement are described in Table 4.

Table 4

Variable Descriptions and Type

| Variable | Data type | Content |
|--|------------------|---|
| Dependent variable: Value of Group Work subscale. | Interval/ratio | Likert scale (<i>strongly agree-strongly disagree</i> ; labeled to numeric range 1- 5). |
| Independent variables: Global emotional intelligence | Interval/ratio | Likert scale (<i>completely disagree-completely agree</i> ; labeled to numeric range 1-7). |
| Global cultural intelligence | Interval/ratio | Likert scale (<i>strongly disagree-strongly agree</i> ; labeled to numeric range 1-7). |
| Big Five Inventory | Interval/ratio | Likert scale (<i>strongly disagree-strongly agree</i> ; labeled to numeric range 1-5). |
| Race/ethnicity | Categorical | Asian or Pacific Islander, Black or African American, Caucasian, Latino(a), and other. |
| Gender | Categorical | Male, female, other. |
| Age | Interval/ratio | Years. |
| First generation status | Categorical | Yes, no, not sure. |
| Pre-health profession designation | Categorical | Allied health, Dentistry, Medicine, Nursing, Pharmacy, other career options. |

The variables were examined using the analytic framework described in Figure 4. The analytic framework reflects an integration of the theoretical and conceptual frameworks (see Chapter Two), and informed by Crowne's (2007) research asserting that emotional and cultural intelligence has a distinct, but interrelated relationship within the social intelligence domain.

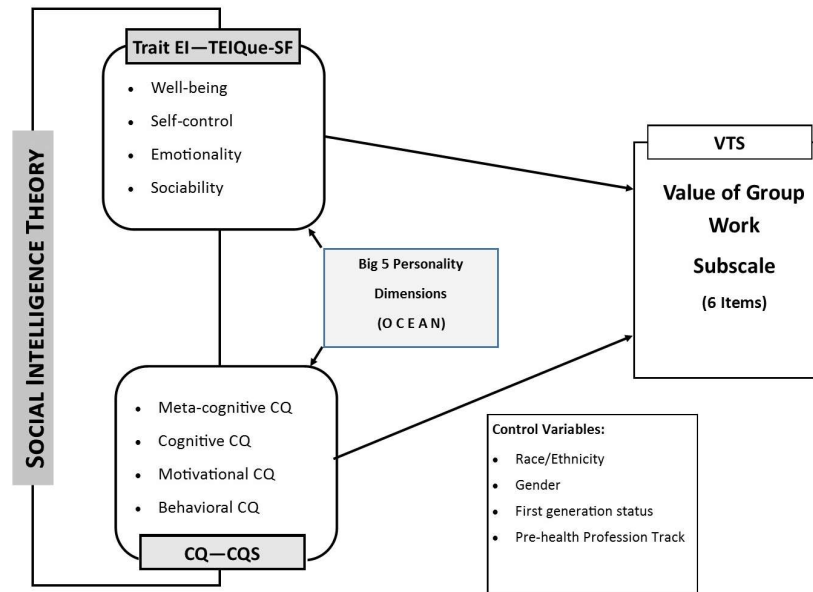


Figure 4. Analytic framework for examination of emotional intelligence, cultural intelligence, and team-based learning.

Trait EI = Trait Emotional Intelligence; TEIQue-SF = Trait Emotional Intelligence Questionnaire – Short Form; CQ = Cultural Intelligence; CQS – Cultural Intelligence Scale; VTS – Value of Teams Survey. OCEAN = Openness, Conscientiousness, Extraversion, Adaptability, & Neuroticism.

Source of Student Data

Permission to conduct the study using institutional student data was secured from the university's Office of Planning and Decision Support (OPDS), which is the university's central data repository. The data was collected by the university's Survey Evaluation Research Laboratory (SERL). SERL is a university-based, applied research office that provides a range of fee-based services to assist university faculty, staff, and students in conducting research studies. SERL was contracted by the researcher to administer the survey process to ensure strict anonymity and confidentiality. Specific data collection procedures are delineated below.

Data Collection Procedures

The mode of data collection will be a self-administered, web-based survey. Self-administered surveys are a useful, if not the preferred, tool in cross-sectional studies (Leedy & Ormrod, 2005). There are a number of strengths associated with the use of a web-based survey methodology to include low administration costs, improved data accuracy (Fowler, 2009; Wyatt, 2013), and access to multimedia technology that creates stronger interactivity (Wyatt, 2013). Web-based surveys also provide users with flexibility in terms of when or where they access the survey (Sax, Glimartin, & Bryant, 2003).

The survey reflected a composite of four pre-existing instruments and a set of researcher-developed questions to obtain demographic information (see Appendix B). REDCap, a university supported, secure web-based application, was used to create online surveys. Statistical Package for Social Sciences® (SPSS), was used for statistical analysis in this study.

Administration of the Survey Instrument

The survey was administered in the Spring 2017 academic year (February/March). The 8-week time frame accounted for key events such as major course examination periods, scheduled school closings, and other major university-sponsored student events. The time frame also allowed first-year students sufficient time to acculturate to the university experience. SERL launched the web-survey employing a three-wave protocol that included: 1) an e-mail invitation with the link for completing the on-line survey (see Appendix C), 2) a reminder email to all non-responders approximately a week following the first invitation, and 3) a second e-mail reminder sent two days prior to the conclusion of the survey period.

An additional recruitment strategy included promotion of the study by the Advising Office, which serves as an effective sponsor (Dillman, Smyth, & Christian, 2014). The Advising Office maintains ongoing contact with pre-health and pre-professional students. Announcements for events and programs pertinent to the general pre-health and pre-professional student population is done primarily through the use of the Blackboard learning management system. Further, the Blackboard system provides a mechanism to broadcast an email to pre-health students based on their health profession program of interest. Promotional materials containing clear instructions for accessing the survey were posted on the student's Blackboard announcement page for the duration of the data collection period. At the conclusion of the data collection period, SERL provided a raw SPSS data file to be used for researcher analysis.

Data Collection Limitations

The method of data collection has implications for the rate and nature of responses to surveys (Groves et al., 2009). According to Groves et al., a prominent issue with data collection in survey research is error caused by nonresponse. While Web-based surveys are generally advantageous they also present access issues (Groves et al., 2009). This may be less of an issue for college students as technology access and use for this population is “commonplace” (Jones, 2002, p. 2). Further, the use of e-mails to deliver the survey is appropriate to address access issues as all students are assigned a university e-mail addresses upon admission to the mid-Atlantic University.

A field pretest was conducted to uncover potential issues that may impact distribution or responses to the survey. Ten students were recruited from two public universities who are interested in health profession careers and are in their third or fourth year of enrollment. This population of students is similar to the target student population. Seven of the 10 students

recruited completed the pretest survey. The responses provided insight on both the data collection process, as well as the content and usability of the survey instrument (Groves et al., 2009). An overview of the pretest responses indicated a general sense of ease of use and understandability. Specifically, the respondents reported the survey on average appeared to have taken 10-15 minutes. Six of the respondents rated the clarity of the survey as good or better, one student rated the clarity as fair. Five respondents reported no concerns with any questions and two respondents reported there were concerns. All respondents reported the incentives offered were reasonable, the instructions in each section were clear, and the demographic questions allowed them to accurately self-identify. Finally, the majority of respondents reported to have prior knowledge of concepts covered by the survey to include team-based learning, emotional intelligence, cultural intelligence, and personality. Based on the overall supportive direction of the responses the researcher determined the survey was suitable for distribution without modifications.

Additional methods used to address non-response concerns included adding a statement that the study will be used to increase understanding of factors that may support student success. This was done to provide a sense of relevance for the study with the population. The message was placed in a pre-notification e-mail and repeated in the official survey launch e-mail. A sponsorship strategy was used as students were encouraged to participate in the study by the Advising Office serving as a sponsor (Dillman, Smyth, & Christian, 2014). A disclaimer statement was prominently featured indicating that responses to the survey are optional and will not impact their relationship with the Advising Office. A \$10 eVisa gift card was provided electronically to the first 150 respondents who complete the survey. Also, a \$100 credit to the university bookstore was raffled off to serve as an additional incentive for students to complete

the survey. The use of cash incentives to increase response rates is a well-established strategy. Consideration was given to offering an amount that does not have a coercive effect (Groves et al., 2009). To ensure confidentiality, the incentive process was conducted by a third-party entity (SERL). Respondents were directed to SERL to access the participation incentive and to receive the raffle for the bookstore credit for the chosen recipient.

Another consideration is the potential of socially desirable responses due to the potentially sensitive nature of questions contained in the emotional intelligence, cultural intelligence, and Big Five measures. Day and Carroll (2008) examined the issue of social desirability with respect to ability and trait emotional intelligence models. The findings indicated students showed higher levels of socially desirable responses on the trait-based measure (EQi) than did on the ability-based measure (MSCEIT). The study also addressed research that indicated personality and other non-cognitive measures also have a higher likelihood of individuals “faking” (Day & Carroll, 2008, p.765) responses. However, the researchers pointed out the issue of faking is influenced by the importance individuals place on the experience such as in employment situations of university admissions processes. The use of a self-administered Web survey should reduce the degree of social desirability based on the inherent anonymity involved (Groves et al., 2009). In addition, potential respondents were informed in recruitment emails that participation in the study would not in any way impact their academic profile or relationship with their respective pre-health advisors. This strategy should help to mitigate the students’ desire to fake responses as there is nothing of importance at stake (Day & Carroll, 2008).

Delimitations

It is important to establish the parameters of a research study. Leedy and Ormrod (2005) posit, “[t]he limits of the problem should be as carefully bounded for a research effort as a parcel of land is for a real estate transfer” (p.55). This study hopes to contribute to the advancement of preparing aspiring health professions students for interprofessional education and practice. However, the chosen sample design poses a threat to external validity in that the unique institutional factors present at the single institution chosen restrict generalizability to students at other universities (Polit & Hungler, 1999).

Institutional Review Board Approval Required

This study qualified as EXEMPT under 45 CFR part 46.101(b) Category 2. The study had minimal to no risk to subjects. Data were collected using an online survey without the participation of the investigator as outlined in Category 2. The data obtained from survey responses are anonymous as no identifiers were captured. Finally, there were no combinations of variables that could be used to identify respondents. A copy of the Institutional Review Board approval letter is provided as Appendix D.

CHAPTER 4. DATA ANALYSIS AND RESULTS

This chapter details the data analysis and results for this exploratory study. The chapter presents (a) a review of demographic statistics; (b) reliability testing for measurement instruments; (c) statistical findings for primary and secondary hypotheses; and (d) summary of results.

The purpose of this study was to examine the relationship of specific non-academic factors, emotional intelligence and cultural intelligence, with students' attitudes towards team-based learning in an undergraduate pre-health student population. Based on extant literature, the variables trait emotional intelligence and cultural intelligence were hypothesized to be correlated with student attitudes about team-based learning. Descriptive statistical methods were used to help further organize the data and provide summary information of demographic variables reflected in the sample (Leedy & Ormrod, 2005). Frequency of responses and percentiles were used to characterize demographic variables such as race/ethnicity, gender, first-generation, academic classification, and pre-health profession designation. Measures of central tendency (i.e., mean) and variation (i.e., standard deviation) were used to provide characteristics of key study variables including emotional intelligence, cultural intelligence, and the Value of Group Work survey responses.

Descriptive Statistics

There were 1849 pre-health students identified by the University who are classified as either freshmen or sophomores. Of the target population, there were 381 responses. Of these

responses, 278 records were considered complete, meaning each of the required questions had a response selected. The completed cases reflect a 15.03% response rate. Three of the 278 complete records were ultimately deleted based on the number of “skipped” responses to the dependent variable (Value of Group Work). The final file used for analysis included 275 cases.

The sample size used for this study is sufficient for the intended analysis (i.e., bivariate correlation and multiple regression analysis). According to G*Power (Faul, Lang, & Buchner, 2007), a sample of 138 is sufficient for a two-tailed bivariate correlation with correlation p H1 .3; 95% confidence level; and .95 power. G*Power (Faul, Lang, & Buchner, 2007) recommends a sample size of 69 for linear multiple regression, fixed model, R^2 increase at .15 (medium) effect size, 95% confidence level, .80 power, 2 tested predictors (EI & CQ), and 22 total predictors including demographic (15)¹³ and personality variables (5) and two primary variables.

Incomplete responses occurring within the independent variables were minimal (less than 2% on average) and determined through Little’s MCAR test (Rose & Fraser, 2008) to be missing at random. Therefore, the use of an imputation technique was recommended as the level of missing cases would likely have minimal influence on the outcomes of the analysis (Garson, 2015). The Expectation-Maximization (EM) imputation model featured in versions of SPSS is a well-supported imputation tool and was employed to address missing values in this study (Garson, 2015).

Demographic Profile

Table 5 provides the demographic profile of the 275 students in the study sample compared with the population of pre-health students enrolled (population) at the University as of fall 2016. Differences between the sample and population of pre-health students of more than three

¹³ Count of demographic variables includes dummy variables.

percentage points included: African Americans 3.12 percentage points higher for the sample population and students identifying as having two or more races had a difference 3.04 percentage points higher for the sample population. There were noticeable differences in gender categories with females reflecting a difference of 9.12 percentage points higher in the sample population and males with a difference 9.78 percentage points higher in the total population. With the exception of pre-Dentistry, there were also differences of more than three percentage points among each of the pre-health major tracks. Pre-Medicine had a 9.9 percentage points higher in the total population and Other Health Careers category had a 9.9 percentage points higher in the sample population.

Table 5

Comparative Demographic Profile of Study Sample and Fall 2016 Enrolled Pre-health Students

| Category ¹⁴ | n | % Sample | N | % Population | % Difference |
|-----------------------------------|-----|-------------|-------|-----------------|-----------------|
| Race/Ethnicity (n = 275) | | | | | |
| American Indian/Alaskan | 1 | .4% | 4 | .15% | .25 |
| Asian | 71 | 25.8% | 735 | 28.01% | -2.21 |
| Black /African American | 66 | 24% | 548 | 20.88% | -3.12 |
| Hawaiian / Pacific Islander | 0 | 0- | 0 | 0 | - |
| Hispanic / Latino | 19 | 6.9% | 222 | 8.46% | -1.56 |
| International | 0 | 0 | 58 | 2.21% | -2.21 |
| Two or More Races | 25 | 9.1% | 159 | 6.06% | 3.04 |
| Unknown | 3 | 1.1% | 39 | 1.49% | -.39 |
| White | 84 | 30.5% | 859 | 32.74% | -2.24 |
| Gender (n = 275) | | | | | |
| Female | 217 | 78.9% | 1,831 | 69.78% | 9.12 |
| Male | 56 | 20.4% | 792 | 30.18% | -9.78 |
| Other | 2 | <1% | 1 | <1% | - |
| Age (n = 273) | | | | | |
| 18-21 | 272 | 99.6% | 2,392 | 91% | 8.5 |
| 22 and over | 1 | <1% | 173 | 9% | 8% |
| | | | N/A | N/A | |
| First Generation Status (n = 265) | | | | | |
| First Generation | 123 | 46.4% | - | - | - |
| Not First Generation | 142 | 53.6 | - | - | - |

¹⁴ Parentheses beside main categories represent sample population counts.

Table 5 - continued

| Category | n | % Sample | N | % Population | % Difference |
|------------------------|-----|-------------|-------|-----------------|-----------------|
| Major Choice (n = 274) | | | | | |
| Pre-Allied Health | 32 | 11.7% | 393 | 15% | -3.3 |
| Pre-Dentistry | 26 | 9.5% | 224 | 9% | .5 |
| Pre-Medicine | 107 | 39.1% | 1,283 | 49% | -9.9 |
| Pre-Nursing | 59 | 21.5% | 405 | 15% | 6.5 |
| Pre-Pharmacy | 12 | 4.4% | 214 | 8% | -3.6 |
| Other Health Career | 38 | 13.9% | 105 | 4% | 9.9 |
| Totals | 275 | | 2,624 | | |

Instrumentation Profile

Table 6 provides descriptive analysis of scale and subscale scores for key variables. In the case of each scale and subscale, a higher score indicates students have a higher level of that particular quality. For example, the general profile of scale scores indicates moderate to high levels of the value students place on group work, emotional intelligence, and on cultural intelligence. In particular, the Value of Group Work mean and standard deviation calculated in this sample ($M = 3.84$, $SD = .68$) are slightly higher than findings from Levine et al (2004) ranging from ($M = 3.35$, $SD = .45$) to ($M = 3.78$, $SD = .42$). Similarly, calculated means and standard deviation for global trait emotional intelligence in this sample ($M = 5.29$, $SD = .73$) are slightly higher than ($M = 4.78$, $SD = .72$) calculated in a study by Furnham and Petrides (2003). The mean and standard deviation for cultural intelligence calculated from this sample ($M = 5.06$, $SD = .96$) were also higher than ($M = 3.30$, $SD = .64$) found in Ward et al., (2009).

Table 6

Descriptive Statistics and Reliabilities of Scale Scores

| Scale | Min* | Max* | <u>M</u> | <u>SD</u> | No. Scale Items | α |
|---------------------|------|------|----------|-----------|--------------------|----------|
| Value of Group Work | 1.33 | 5.00 | 3.84 | .68 | 6 | .83 |
| Global EI | 3.23 | 6.90 | 5.29 | .73 | 30 | .91 |
| Well-being | 1.00 | 7.00 | 5.77 | .92 | 6 | .83 |
| Self-control | 2.67 | 7.00 | 4.92 | .87 | 6 | .65 |

Table 6 - continued

| Scale | Min | Max | <u>M</u> | <u>SD</u> | No. Scale Items | α |
|--------------------|------|------|----------|-----------|--------------------|----------|
| Emotionality | 2.63 | 7.00 | 5.28 | .87 | 8 | .71 |
| Sociability | 2.17 | 7.00 | 5.05 | .85 | 6 | .65 |
| Global CQ | 1.45 | 7.00 | 5.06 | .96 | 20 | .94 |
| Metacognitive | 1.00 | 5.60 | 4.28 | .94 | 4 | .87 |
| Cognitive | 1.00 | 7.00 | 4.31 | 1.39 | 6 | .93 |
| Motivational | 2.40 | 7.00 | 5.89 | .98 | 5 | .88 |
| Behavioral | 1.00 | 7.00 | 4.92 | 1.29 | 5 | .92 |
| Big Five Inventory | | | | | 44 | n/a |
| Openness | 2.10 | 4.90 | 3.37 | .79 | 10 | .72 |
| Conscientiousness | 2.11 | 5.00 | 3.99 | .61 | 9 | .80 |
| Extraversion | 1.00 | 5.00 | 3.37 | .78 | 8 | .84 |
| Agreeableness | 2.22 | 5.00 | 4.17 | .58 | 9 | .78 |
| Neuroticism | 1.13 | 4.63 | 2.63 | .69 | 8 | .77 |

N = 275

*Note: Minimum (Min) and Maximum (Max) values are based on imputation techniques used to predict missing values.

Reliability Tests

Table 6 presents Cronbach alpha coefficients that were calculated for each scale and subscale to examine its internal consistency reliability. Higher alpha values indicate greater degrees of internal consistency among scale items (Vogt & Johnson, 2011). Generally, .70 is considered an acceptable alpha coefficient for the scale reliabilities and indicative that the items are measuring the same construct (Vogt & Johnson, 2011).

The scales used in this study demonstrated good reliability and were consistent with reliability scores reported in the respective literature. An .83 alpha was calculated for the dependent variable, Value of Group Work. This is consistent with an .81 alpha found in the original study by Levine et al., (2004). As well, global trait emotional intelligence ($\alpha = .91$) and global cultural intelligence ($\alpha = .94$) demonstrated reliabilities consistent with previous research indicating .87 alpha for trait emotional intelligence (Petrides et al., 2010) and .79 alpha for cultural intelligence (Ang et al., 2006).

Data Analysis and Statistical Findings

Data Analysis Procedures

The survey response data was imported into SPSS V.23®, which was used for analysis. The significance level chosen for all phases of analysis is $p = .05$. The data analysis phase of quantitative research encompasses specific steps designed to organize, process, and interpret often extensive amounts of data collected (Polit & Hungler, 1999).

As part of organizing collected data for analysis, post-survey adjustment steps were employed to assess the degree to which the data file had missing or erroneous data (Groves et al., 2009). An important step in preparing the data for analysis is referred to as data cleaning, which helps to ensure that the survey data is accurate and reliable (Polit & Hungler, 1999). Specific actions taken to prepare data for analysis in this study used the following 5-step process (Bainbridge, 2009):

- Created a duplicate copy of the data file to be used for the cleaning process to prevent having to repeat the data export process in the event important data are inadvertently deleted.
- Created a sub-file consisting of a sample of records to be used to refine and perfect the data cleaning steps needed to clean the data file.
- Determined what a complete data record is based on obtaining a complete response to all required variables needed to complete each step of the analysis process. This step was applied to each research question and hypothesis.
- Identified the average time respondents used to complete the survey and cross-referenced that against responses to identify respondents who may have completed the survey in a significantly less time than the average. Also, review the data for response patterns that may suggest respondents arbitrarily and consistently chose responses.

The following analysis and statistical techniques were used to examine the three research questions and associated hypotheses.

Correlational Analysis

Research Question 1: The first research question examined the relationship between emotional intelligence and attitudes towards team-based learning. The following hypotheses guided examination of the research question:

H1_a: There is a relationship between global trait emotional intelligence and attitudes towards team-based learning.

Pearson Product-Moment Correlation (Pearson r) was used to examine the relationship between global trait emotional intelligence and the Value of Group Work. A weak to moderate, statistically significant correlation ($r = .364$, $p < .01$) was calculated, which supports the hypothesis.

H1_b: There is a relationship between subfactors of trait emotional intelligence (i.e., Emotionality, Self-control, Sociability, and Well-being) and attitudes towards team-based learning.

Pearson r was used to examine the relationship among trait emotional intelligence subscales and the Value of Group Work. As illustrated in Table 7, weak to moderate statistically significant correlations were found for each of the four trait emotional subscales. The strongest correlation was between Value of Group Work and Emotionality ($r = .311$, $p < .01$). The hypothesis was supported by this result.

Table 7

Zero-order Correlation Coefficients for Trait Emotional Intelligence Global and Subscales and Value of Group Work

| Scales | 1 | 2 | 3 | 4 | 5 |
|------------------------|---|-------|-------|-------|-------|
| 1. Value of Group Work | 1 | .288* | .299* | .311* | .299* |
| 2. Well-being | | 1 | .621* | .630* | .509* |

Table 7 - continued

| Scales | 1 | 2 | 3 | 4 | 5 |
|-----------------|---|---|---|-------|-------|
| 3. Self-control | | | 1 | .571* | .494* |
| 4. Emotionality | | | | 1 | .570* |
| 5. Sociability | | | | | 1 |

N = 275; *p>.01, 2-tailed

William's modification of the Hotelling (Hotelling's t-test) analysis was used to compare the correlation coefficients for Value of Group Work and each of the emotional intelligence subscales (Weaver & Wuensch, 2013). The results of the Hotelling's t-test analysis (see Appendix E) showed no statistically significant difference among the correlated Value of Group Work and emotional intelligence subscales.

Research Question 2: The second research question examines the relationship between cultural intelligence and attitudes towards team-based learning. The following hypotheses guided examination of the research question:

H2_a: There is a relationship between cultural intelligence and attitudes towards team-based learning.

Pearson r was used to examine the relationship between global cultural intelligence and the Value of Group Work. A weak, statistically significant correlation ($r = .222$, $p < .01$) was calculated, which supports the hypothesis.

H2_b: There is a relationship between the four dimensions of cultural intelligence (i.e., Metacognitive, Cognitive, Motivational, and Behavioral) and attitudes towards team-based learning.

Pearson r was used to examine the relationship among cultural intelligence subscales and the Value of Group Work. As illustrated in Table 8, weak statistically significant correlations were found for three of the four cultural intelligence subscales (Metacognitive, Motivational, and Behavioral); the Cognitive subfactor was not

significant. The strongest correlation was between Value of Group Work and Motivational cultural intelligence ($r = .311$, $p < .01$). The hypothesis was partially supported by this result.

Table 8

Zero-order Correlation Coefficients for Cultural Intelligence Global and Subscales and Value of Group Work

| Scales | 1 | 2 | 3 | 4 | 5 |
|------------------------|---|-------|-------|-------|-------|
| 1. Value of Group Work | 1 | .201* | .091 | .311* | .143* |
| 2. Metacognitive | | 1 | .570* | .541* | .608* |
| 3. Cognitive | | | 1 | .387* | .463* |
| 4. Motivational | | | | 1 | .383* |
| 5. Behavioral | | | | | 1 |

N = 275; * $p < .01$, 2-tailed

Hotelling's t-test analysis was used to compare the correlation coefficients for the Value of Group Work and the three cultural intelligence subscales that had significant correlations. The results of the Hotelling's t-test analysis (see Appendix E) showed a significant difference between correlation coefficients for motivation and metacognitive subscales ($t(272) = 1.989$, $p = .048$) and for motivation and behavioral subscales ($t(272) = 2.615$, $p = .009$). Thus, the relationship between motivation and Value of Group Work is further distinguished from the other subfactors.

Hierarchical Regression Analysis

Research Question 3: The third research question is central to the study as a whole as it seeks to understand the variance contributed by emotional and cultural intelligence, above that of personality factors, in predicting students' value placed on working in groups. A three-step hierarchical multiple regression analysis was used for analysis as presented in Figure 5.

H3: A significant degree of variance in attitudes towards team-based learning will be predicted by emotional intelligence and cultural intelligence above and beyond the Big Five personality factors.

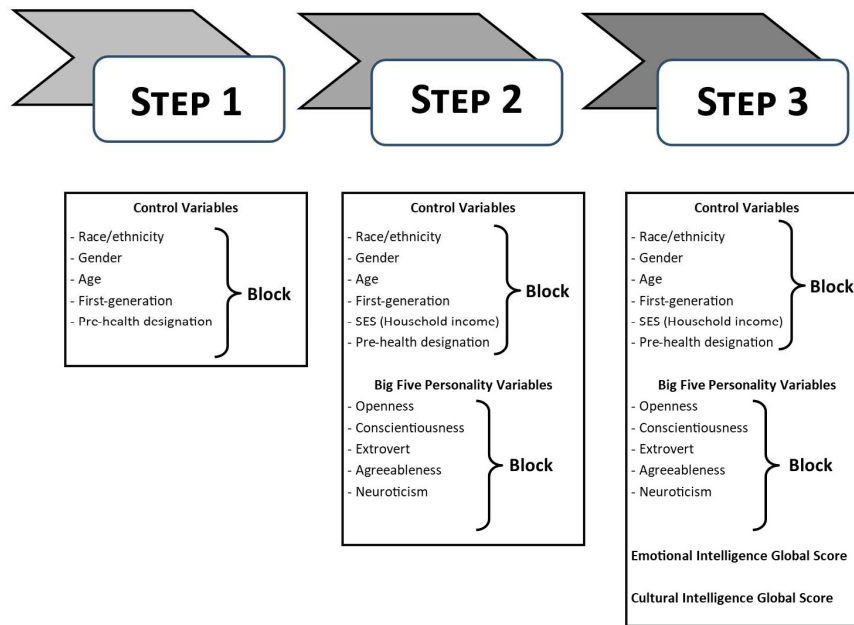


Figure 5. Conceptual model for stages of the hierarchical regression analysis

Prior to conducting the regression analysis, independent variables of the categorical type were transformed to “dummy variables”. Also, a primary aim of multiple regression is the ability to generalize the results to a broader population. In doing so, there are assumptions that must be examined to inform the regression analysis. The assumptions tested in this analysis, as outlined in Keith (2006), were successfully met and included: linearity, independence, homoscedasticity, normality, multi-collinearity, and effects of outliers.

Variables were entered in the regression model in three steps based on theory, or in the case of demographic variables by their “temporal precedence” (Cohen et al., 2003, p. 64).

Demographic variables were entered as a block in step one as control variables as follows: 1) race/ethnicity; 2) gender; 3) age; 4) first generation status; and, 5) pre-health profession major.

As indicated in Table 9 the demographic variables were not significant predictors of the dependent variable, $R^2 = .075$, $F(15, 244) = 1.323$, $p = .189$.

Big Five personality scores were entered in step two also as covariates and used to test whether the primary variables of interest perform beyond their contributions. The Big Five scores were entered in this step as a block. The Big Five personality factors were statistically significant accounting for about 19% of variance of Value of Group Work, $R^2 = .189$, $F(20, 239) = 2.786$, $p < .001$. This reflected an increase of 11% over the variance for demographic variables ($\Delta R^2 = .114$) entered in the preceding step.

Global emotional intelligence and global cultural intelligence are the primary variables of interest and entered in the step three. The variables were hypothesized to account for variance in the Value of Group Work above the Big Five scores entered in step two. The emotional and cultural intelligence variables were statistically significant with an R^2 of about 22%, $R^2 = .218$, $F(22, 237) = 3.007$, $p < .001$. The variables accounted for approximately 3%, ($\Delta R^2 = .029$) of variance beyond the Big Five factors. Based on these results, the hypothesis was supported. It is worth noting, collectively the variables entered in the regression model represented about 22% of the variance in predicting the Value of Group Work, therefore, leaving nearly 80% of the variance unexplained.

Table 9 provides the results of the regression analysis:

Table 9

Summary of Hierarchical Multiple Regression Analysis Predicting Value of Group Work

| Independent Variables | Step 1 | | | | Step 2 | | | | Step 3 | | | |
|-------------------------|--------|------|---------|------|--------|------|---------|------|--------|------|---------|------|
| | B | SE | β | p | B | SE | β | p | B | SE | β | p |
| AI/A | .133 | .688 | .012 | .847 | -.265 | .657 | .024 | .687 | -.076 | .656 | -.007 | .907 |
| Asian/Pacific Islander | .067 | .115 | .043 | .561 | .051 | .112 | .033 | .657 | .039 | .112 | .025 | .731 |
| Black/African American | .174 | .117 | .110 | .137 | .101 | .113 | .064 | .371 | .092 | .111 | .058 | .410 |
| Hispanic/Latino | .267 | .180 | .100 | .141 | .262 | .173 | .098 | .130 | .245 | .171 | .092 | .154 |
| Multiple Race/Ethnicity | .234 | .159 | .100 | .143 | .124 | .155 | .053 | .424 | .077 | .154 | .033 | .616 |
| Other Race | -.193 | .287 | -.043 | .502 | -.058 | .278 | -.013 | .835 | .003 | .277 | .001 | .992 |

Table 9 - continued

| Independent Variables | Step 1 | | | | Step 2 | | | | Step 3 | | | |
|--------------------------------|--------|------|---------|----------|--------------------------------|------|---------|----------|--------------------------------|------|---------|----------|
| | B | SE | β | <i>p</i> | B | SE | β | <i>p</i> | B | SE | β | <i>p</i> |
| Male | .279 | .495 | .167 | .575 | .103 | .475 | .062 | .829 | .066 | .473 | .040 | .888 |
| Female | .256 | .487 | .156 | .579 | .014 | .464 | .009 | .976 | .010 | .461 | .006 | .983 |
| Age | .023 | .059 | .025 | .692 | .010 | .056 | .011 | .858 | .029 | .056 | .030 | .610 |
| No First Gen | -.047 | .088 | -.034 | .598 | -.047 | .084 | -.035 | .575 | -.034 | .083 | -.025 | .684 |
| Allied Health | -.258 | .146 | -.122 | .078 | -.253 | .140 | -.119 | .072 | -.210 | .141 | -.099 | .138 |
| Dentistry | -.258 | .159 | -.108 | .105 | -.233 | .152 | -.093 | .145 | -.156 | .152 | -.065 | .307 |
| Nursing | .040 | .113 | .025 | .724 | -.008 | .109 | -.005 | .945 | .029 | .110 | .018 | .795 |
| Pharmacy | -.622* | .225 | -.177* | .006 | -.585* | .213 | -.166* | .007 | -.540* | .211 | -.153* | .011 |
| Other Health Career | -.219 | .130 | -.114 | .094 | -.167 | .124 | -.087 | .178 | -.138 | .124 | -.072 | .268 |
| Extraversion | | | | | .094 | .059 | .108 | .113 | .059 | .060 | .068 | .404 |
| Agreeableness | | | | | .248* | .085 | .210* | .004 | .190* | .086 | .161* | .028 |
| Conscientiousness | | | | | -.032 | .085 | -.028 | .711 | -.073 | .087 | -.065 | .404 |
| Neuroticism | | | | | -.108 | .075 | -.111 | .152 | -.024 | .082 | -.025 | .767 |
| Openness | | | | | .125 | .081 | .100 | .123 | .052 | .089 | .042 | .558 |
| Emotional Intelligence | | | | | | | | | .196* | .087 | .209* | .024 |
| Cultural Intelligence | | | | | | | | | .078 | .051 | .110 | .128 |
| R = .274 | | | | | R = .435 | | | | R = .467 | | | |
| R ² = .075 | | | | | R ² = .1895 | | | | R ² = .218 | | | |
| Adjusted R ² = .018 | | | | | $\Delta R^2 = .114^{**}$ | | | | $\Delta R^2 = .029^*$ | | | |
| | | | | | Adjusted R ² = .121 | | | | Adjusted R ² = .146 | | | |

p* < .05, one-tailed. *p* < .01, one-tailed.

Note. AI/A= American Indian/Alaskan.

Supplemental Analysis

Demographic variables had no significance in the regression model. However, pre-pharmacy as one of the pre-health profession majors remained as a significant predictor in step three of the analysis (*B*= -.540, β = -.153, *t*(260) = -2.560, *p*<.011).

With respect to the Big Five personality factors, Agreeableness was a significant predictor in each step of the analysis (*B*= .190, β = .161, *t*(260) = -2.208, *p*<.028). The significant positive regression weights for Agreeableness indicates that as a student's level of Agreeableness increases so too does the value students place on group work.

Finally, of the primary variables of interest entered in step three, emotional intelligence significantly contributed to the regression model (*B*= .196, β = .209, *t*(260) = -2.269, *p*<.024).

The significant positive regression weights for emotional intelligence indicate that as emotional intelligence increases so does the value students place on group work. Conversely, cultural intelligence did not remain significant in step three ($B = .078$, $\beta = .110$, $p < .128$).

Commonality analysis (Ray-Mukherjee et al., 2014) was used to further distill the unique and shared variance between emotional intelligence, cultural intelligence, and Big Five factors. Utilizing the process outlined in Nimon (2010), variables of interest were entered into a SPSS script designed to produce a commonality matrix showing the coefficients and percentage of total variance contributed for variables alone and in combination. There was a total of 128 unique and joint commonality products created for analysis. Table 10 presents the most relevant outcomes of the analysis.

Table 10

Commonality Matrix Demonstrating the Unique and Common Effects of Emotional Intelligence, Cultural Intelligence, and Big Five Factors on Students Attitudes Towards Group Work

| Commonality Product | Commonality Coefficient | % Total Variance |
|---|-------------------------|------------------|
| EI (Unique) | .0215 | 11.6% |
| BFI-Agree (Unique) | .0204 | 11% |
| EI & BFI-Agree (Common) | .0134 | 7.2% |
| EI & BFI-Agree & BFI-Neuroticism (Common) | .0103 | 5.6% |
| EI & BFI-Neuroticism (Common) | .0102 | 5.5% |
| CQ (Unique) | .0102 | 5.5% |

Total Variance = 18.58%

Note. EI = Global Emotional Intelligence; BFI-Agree = Agreeableness; CQ = Cultural Intelligence

As indicated by results of commonality analysis, most of the variance was credited to global emotional intelligence (11.6%) and Agreeableness (11%). A notable amount of the variance remaining is common among global emotional intelligence-Agreeableness (7.2%), and global emotional intelligence-Agreeableness-Neuroticism (5.6%). The common effects of global emotional intelligence-Neuroticism and unique variance credited to global cultural intelligence

are equal at 5.5%. Therefore, consistent with regression analysis results, the commonality analysis indicates the effects of cultural intelligence overlaps with unique variance credited to global emotional intelligence and Agreeableness. As well, common effects of global emotional intelligence, Agreeableness, and Neuroticism overshadow unique variance attributed to global cultural intelligence.

Summary of Results

The purpose of this study was to examine the relationship of specific non-academic factors, emotional intelligence and cultural intelligence, with students' attitudes towards team-based learning in an undergraduate pre-health student population. Correlation analysis demonstrated support for hypothesis H1a and H2a, indicating there is a significant positive relationship between the value students in this sample assign to working in groups relative to their level of emotional and cultural intelligence. Further, hypothesis H1b was supported, indicating that each subfactor for emotional intelligence (i.e., well-being, self-control, emotionality, and sociability) had a significant positive relationship with the value students place on group work. Conversely, hypothesis H2b demonstrated partial support for the relationship among cultural intelligence subfactors and the value students place on group work. Specifically, the metacognitive, motivational, and behavioral subfactors had a significant positive relationship, while the cognitive subfactor did not.

Regression analysis was used to examine hypothesis H3 and demonstrated emotional intelligence and cultural intelligence did contribute about 3% variance above and beyond that of the Big Five personality factors, controlling for pertinent demographic variables. The actual effect size (.029) is small statistically, but has practical significance within the social science realm (Keith, 2006). These results will be further analyzed and discussed in Chapter Five.

CHAPTER 5. DISCUSSIONS, RECOMMENDATIONS, AND IMPLICATIONS

This exploratory study examines the relationship of specific non-academic factors, emotional intelligence, and cultural intelligence, with students' attitudes towards team-based learning in an undergraduate pre-health student population. Specifically, this study addressed the following overarching research questions:

1. What is the relationship between emotional intelligence and attitudes towards team-based learning among undergraduate pre-health profession students?
2. What is the relationship between cultural intelligence and attitudes towards team-based learning among undergraduate pre-health profession students?
3. What degree of variance in attitudes towards team-based learning is predicted by emotional intelligence and cultural intelligence, above and beyond Big Five personality factors?

This chapter discusses the results of the study and the associated limitations inherent in those results. This chapter also expounds on implications of this study from a policy and practice perspective, and offers recommendations. The chapter culminates with a discussion of conclusions and prospects for future research.

Discussion of Findings

The discussion of key findings is guided by the results of the study as they relate to the theoretical and conceptual framework presented in Chapter Two. Also, important to the discussion of these findings is the broader context of interprofessional education and the

underpinning of team-based learning. As evidenced in the extant literature more, research is needed to understand the attitudes health profession students have towards interprofessional education (Leipzig, 2002). However, very little is known about factors that shape student attitudes towards teamwork (Curran et al, 2008). Moreover, “little is known about [pre-health] students who are pursuing entry to health professions training [programs] and their attitudes towards interprofessional teams and education” (Dumke, VanderWielen, Harris, & Ford-Smith, 2016). The following discussion seeks to advance our knowledge of factors that may help prepare pre-health students for the expectations of teamwork prior to engaging the interprofessional experience.

Research Question 1: What is the relationship between emotional intelligence and attitudes towards team-based learning among undergraduate pre-health profession students?

The two hypotheses that guided examination of this research question predicted that emotional intelligence, both globally and at the subfactor level, would have a significant relationship with the value students place on working in groups. The findings supported this assertion as global emotional intelligence and subfactors demonstrated significant positive correlations. In other words, as a student’s emotional intelligence score increased his or her Value of Group Work score also went up. While not conclusive, this finding adds further support and insight into understanding the role of emotions in team learning generally (Ilarda & Findlay, 2006; Bar-On, 2010; Luca & Tarricone, 2011) and in health professions settings specifically (Carrothers et al., 2000 ; McQueen, 2003; Pau et al., 2006; Kooker, Shoulz, & Codier, 2007; Birks, McKendree, & Watt, 2009; Clarke, 2010; Por, Barriball & Fitzpatrick, 2011). As already

mentioned, health profession students face a unique set of pressures stemming from the intensity and scope of their academic and clinical experiences (Birks, McKendree, & Watt, 2009). These pressures are replicated in some ways with pre-health students as they are, fairly or unfairly, expected to arrive to health professions programs with their academic, experiential, and even emotional profiles intact (Carrothers et al., 2000). Further analyses to determine if there were significant differences among correlated coefficients indicated no significant differences.

Research Question 2: What is the relationship between cultural intelligence and attitudes towards team-based learning among undergraduate pre-health profession students?

The two hypotheses that guided examination of this research question predicted that cultural intelligence, both globally and at the subfactor level, would have a significant relationship with the value students in this sample place on working in groups. The findings were mixed in that global cultural intelligence had a significant positive correlation, but only three of the four subfactors demonstrated significant positive correlations.

Further analyses were conducted on the subfactors to determine if there were significant differences among the correlated coefficients. Significant differences were found between motivation and cognition, and motivation and behavior. To further test this finding, an exploratory multiple regression analysis was conducted to test the predictive capacity of the four cultural intelligence subscales to Value of Group Work. Motivation was the only subscale to have a significant beta, ($\beta = .260$, $p = .000$). This supported the hoteling t analysis results demonstrating that Motivation is more pronounced in its relationship with the Value of Group Work.

This finding aligns with advocates of motivational theories of intelligence who consider it an important contributor to student achievement beyond general intelligence (Steinmayr & Spinath, 2009). The finding is also promising in the sense that intrinsic motivation is among a number of factors that are considered integral to students' successful performance in team learning situations (Johnson, Johnson, & Smith, 1998). As applied to cultural intelligence, motivation provides individuals with the "desire and energy" (Wang, Heppner, Wang, & Zhu, 2015, p.54) to participate in culturally diverse social interactions. In other words, motivation may drive an individual to interact with others from different cultures and is expressed as both an interest in engaging others, as well as potentially possessing the capability (e.g., self-efficacy) to do so (Early & Ang, 2003).

Of note, the cognitive subfactor did not have a significant relationship with Value of Group Work. This is understandable, if not expected, considering the focus of this study on attitudinal dimensions of working in groups versus that of a behavioral context. Cognitive cultural intelligence focuses on how an individual utilizes their declarative and procedural knowledge when faced with new cultural information (Early & Ang, 2003). It is a reflection of an individual's knowledge of the customs and practices of other cultures attained formally or informally over time (Ang, Dyne, & Tan, 2008). The Value of Group Work scale is not designed to access an individual's cultural knowledge or functionality. Given this, one would expect cognitive cultural intelligence to have more relevance in research focused in an interactive cultural context that permits an individual to display his or her cultural knowledge. Notwithstanding, cognitive cultural intelligence is relatively easy to develop through the use of traditional educational tools such as case-based videos or interactive discussion sessions, written materials, and simulation strategies such as role-playing (Early & Ang, 2003).

Research Question 3: What degree of variance in attitudes towards team-based learning is predicted by emotional intelligence and cultural intelligence, above and beyond Big Five personality factors?

As stated in previous sections, research question three is central to the study's aim of understanding the influence of the non-cognitive factors of emotional and cultural intelligence in shaping students' attitudes towards teamwork. The results (Table 9) were generally supportive of the hypothesis, predicting that emotional and cultural intelligence would account for variance above that of the Big Five. Global emotional and cultural intelligence scores were entered as a block and accounted for about 3% incremental variance above and beyond the Big Five in predicting student attitudes towards working in groups. The statistically small effect size is consistent with findings in behavioral research (Keith, 2006) and consistent with research examining the incremental validity of emotional intelligence. For example, a meta-analysis conducted by Joseph and Newman (2010) examined the validity of ability and mixed-model versions of emotional intelligence. The incremental validity beyond the Big Five for each of the measures used included: .015 (performance-based ability model), .017 (self-report ability model); and, .157 (self-report mixed-model). Another study by Gardner and Qualter (2010) examined the concurrent and incremental validity of three-trait emotional intelligence measures in relationship to the Big Five on six criterion variables such as: hostility, happiness, and life satisfaction. With respect to incremental validity results, changes in R^2 were generally small ranging from .03 to .17. Another meta-analysis by Siegling, Vesely, Petrides, and Saklofske (2015) found incremental validity results ranging from .01 to .18 in eight studies examining the TEIQue-SF with the Big Five.

The incorporation of the Big Five personality factors as covariates entered in block two of the regression analysis differs from the theoretical framework developed by Crowne (2007:2009). However, the intersections of personality with emotional intelligence (Day & Carroll, 2003; Petrides, Pita, & Kokkinaki, 2007; Brannick et al., 2009) and cultural intelligence (Early & Ang, 2003; Sahim, Gurbuz, & Koksas, 2014) is well documented in the literature. Further, examining the incremental validity of emotional and cultural intelligence in the context of this study was important for practical reasons as the use of personality assessments are popular within academic settings primarily as part of retention strategies (Tross, Harper, & Osher, 2000; DeBerard & Spielmans, 2004), to help assess student capabilities (Schreiner & Anderson, 2005), or to better match advisor personality preferences with that of student advisees (Mottarella, Fritzsche, & Cerabino, 2004). The incorporation of the Big Five proved useful in this study as emotional intelligence ultimately credited for the incremental variance in the regression model. As indicated in Table 9, cultural intelligence was removed from the regression model, $\beta=110$, $p = .128$. The results suggested global emotional intelligence, $\beta=209$, $p = .024$ and Agreeableness $\beta=161$, $p = .028$ overlaps variance with cultural intelligence. The commonality analysis (Table 10) supported the regression analysis results. However, the analysis further indicated that the common variance contributed by global emotional intelligence, Agreeableness, and Neuroticism have more explanatory power in predicting student attitudes towards group work. The results of the commonality analysis are also consistent with findings in research literature. It is plausible, as studies suggest (Luca & Tarricone, 2001; Mcallin & Bamford, 2007; Arora et al., 2010), that individuals with sufficient levels of emotional intelligence are generally dispositioned towards working well with others.

With respect to the influence of the Big Five personality factors, Agreeableness is an important variable in the functioning of cultural intelligence. In work by Li, Mobley, and Kelly (2015), the relationship between cultural intelligence and Openness was found to be significantly influenced by the level of Agreeableness. Specifically, when subjects within the sample reported high levels of Agreeableness, Openness was significantly related to three of the cultural intelligence dimensions (i.e., Behavioral, Metacognitive, and Cognitive). The relationships were virtually eliminated when Agreeableness levels were low (Li, Mobley, & Kelly, 2015). As well, the influence of Agreeableness would likely be amplified when assessing attitudinal aspects of an individual's interest in working in groups.

There is also a likelihood that the profile of the sample, in that the students were ages 19-21, influenced the predictive capacity of cultural intelligence. Studies indicate cultural intelligence is significantly influenced by the quantity and quality of individual's experiences in culturally diverse settings (Early & Ang, 2003; Crowne, 2008; Shannon & Begley, 2008). The extent of cross-cultural experiences was not among the variables examined; however, it is conceivable that the extent of such interactions among the sample of freshman and sophomore students is limited.

Another noteworthy finding occurs in examining individual predictors that demonstrated significance in the model. Pharmacy was one of the values available in demographic variables controlled for in step one of the regression analysis. In the final step of the analysis, pharmacy had $\beta = -.153$, $t(260) = 2.560$, $p = .011$. This indicates that students self-selecting as pre-pharmacy would be expected to have a .153 lower score on value of group scale than pre-medical students¹⁵. This result is positioned among mixed findings in the literature comparing the

¹⁵ Premedical students were coded as the reference category based on the expected higher number of cases. See Meyers, Gamst, & Guarino, 2006, pgs. 186-188.

attitudes of pharmacy students and medical students towards team learning. Horsburgh, Lamdin, and Williamson (2001) investigated attitudes towards interprofessional learning in a sample of 180 first year medical, nursing, and pharmacy students. The study found pharmacy and nursing students expressed higher agreement over medical students that teamwork yields greater learning outcomes (Horsburgh, Lamdin, & Williamson, 2001). More specific to the sample used for this study, Dumke et al. (2016) examined the perceptions of pre-health students towards interprofessional learning. In this study, pre-pharmacy students had more positive attitudes towards interprofessional learning than did dentistry students. However, those differences dissipated by the conclusion of the program experience (Dumke et al., 2016). Worth noting, negative weights for categorical variables in regression analysis can also be attributed to the number of variables in the model or multicollinearity among variables (Courville & Thompson, 2001; Nathans, Oswald, & Nimon, 2012)).

Conversely, Lie, Fung, Trial, and Lohenry (2013) examined the attitudes of over 800 medical, pharmacy, and physician assistant students in their junior year of study. The study found no difference in attitudes towards team learning in medical and pharmacy students. Likewise, Coster et al. (2008) reported pharmacy as having the most strident attitudes towards interprofessional learning among all students in the sample, including medicine.

In addition, the non-significant contributions of race and gender demographic variables is notable. Practically, we know that race continues to matter from a general societal perspective (West, 2000) and within social interactions that occur in classroom settings (Beigi & Shirmohammadi, 2012; Gurin, 2012; Payne, Monk-Turner, Smith, & Sumter, 2006). While the demographic variables race (and gender) lacked significance in this study, their importance

warrants serious consideration as interprofessional education pedagogy advances (Baker, Egan-Lee, Martimianakis, & Reeves, 2011).

Further, research has indicated women are more inclined to pursue and excel in team-oriented health sciences settings (Wilhelmsson et al., 2011; Zelek & Phillips, 2003). Work by Ivanova-Stenzel (2005) examined the impact of gender on teamwork in a work environment and found that teams comprised of all women performed better than teams consisting of all men. Additionally, the research found teams that the performance of men was improved when women were on the teams (Ivanova-Stenzel, 2005). Table 11 provides the mean scores for each of the key study variables broken out by gender and racial and ethnic background.

Table 11

Comparison of Mean Scores for Key Study Variables by Gender and Race/Ethnicity

| | | EI | CQ | BFI_E | BFI_A | BFI_C | BFI_N | BFI_O | VGW |
|---------------|--------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Male | Asian / Pacific Islander | 5.23 | 5.33 | 3.37 | 3.89 | 3.73 | 2.60 | 3.61 | 3.71 |
| | Black or African American | 5.60 | 4.94 | 3.36 | 3.97 | 3.60 | 2.15 | 3.85 | 4.15 |
| | Hispanic | 5.55 | 4.83 | 2.44 | 4.56 | 4.44 | 2.69 | 3.90 | 3.58 |
| | White / Caucasian | 5.30 | 5.14 | 3.27 | 3.88 | 3.99 | 2.64 | 3.76 | 3.84 |
| | Multiple Race / Ethnicity | 5.44 | 4.99 | 3.22 | 4.14 | 3.25 | 2.41 | 3.85 | 4.00 |
| | Other* | 3.73 | 5.45 | 1.75 | 3.83 | 3.11 | 3.88 | 3.80 | 3.83 |
| | Total | 5.28 | 5.17 | 3.24 | 3.94 | 3.75 | 2.58 | 3.73 | 3.84 |
| Female | American Indian/Alaska Native* | 6.00 | 3.20 | 3.38 | 5.00 | 4.56 | 1.63 | 4.40 | 3.83 |
| | Asian / Pacific Islander | 5.05 | 5.22 | 3.26 | 4.18 | 3.79 | 2.84 | 3.78 | 3.85 |
| | Black or African American | 5.47 | 5.02 | 3.45 | 4.34 | 4.22 | 2.46 | 3.76 | 3.88 |
| | Hispanic | 5.34 | 5.19 | 3.70 | 4.03 | 4.16 | 2.43 | 3.55 | 4.03 |
| | White / Caucasian | 5.33 | 4.77 | 3.45 | 4.27 | 4.13 | 2.75 | 3.63 | 3.80 |
| | Multiple Race / Ethnicity | 5.52 | 5.41 | 3.46 | 4.32 | 4.03 | 2.45 | 3.82 | 3.98 |
| | Other* | 4.75 | 5.25 | 3.00 | 4.11 | 3.61 | 3.06 | 3.78 | 3.67 |
| | Total | 5.32 | 5.04 | 3.42 | 4.25 | 4.06 | 2.64 | 3.72 | 3.86 |

N = 275

Note: EI = Global Emotional Intelligence; CQ = Global Cultural Intelligence; BFI_E = Extroversion; BFI_A = Agreeableness; BFI_C = Conscientiousness; BFI_N = Neuroticism; BFI_O = Openness; VGW = Value of Group Work. * = American Indian/Alaska Natives and Other categories are less than 1% of the overall cases.

The mean value of group work scores for students self-identified as female (3.86) are only slightly higher than males (3.84). African American males had the highest emotional intelligence mean score (5.60), while students self-identified as Multiple Race/Ethnicity had the highest cultural intelligence mean score. With respect to Agreeableness, the only Big Five factor having significance in the regression model, Hispanic males had the highest mean score (4.56). These results are suggestive that gender and racial and ethnic demographics are worth considering as they may have practical relevance in efforts intended to foster teamwork and collaboration.

More broadly, the final regression model indicates 21.8% of the variance in predicting student attitudes towards group work is attributed to the study variables; therefore, approximately 80% of variance is unexplained in the model. There are at least two factors that may account for some of the unexplained variance: students' age (as a proxy for maturity) (Benson, Ploeg, and Brown, 2010; Emmerling, Shanwal, and Mandal, 2008; Goleman, 1995) and previous experiences working in groups (Dumke et al., 2016; Huddleston, 2003; Ruiz & Adams, 2004).

Attitudes regarding the merits of teamwork evolve over time (Parsell & Bligh, 1999). The age range for the sample in this study is relatively limited as it falls predominantly between 18=21 years of age. Emmerling, Shanwal, and Mandal (2008) suggested a restricted age range influenced the results of their study examining the influence of age and gender on emotional intelligence. Other work by Benson, Ploeg, and Brown (2010) found increasingly higher mean emotional intelligence scores for nursing students across four years: Year 1 (98), Year 2 (103.72); Year 3 (104.56; and, Year 4 (107.80). The study also indicated Interpersonal (103.20 YR1 versus 111.52 YR4) and Stress Management (97.36 YR1 versus 107.48 YR4) emotional

intelligence scores to be higher in fourth year students versus first year students. Based on these findings it is plausible to suggest a broader range of ages in the sample for this study may have influenced results.

Previous research has also examined the influence of age on the Big Five personality factors indicating a similar positive correlation as found with emotional intelligence (Furnham, Eracleous, & Chamorro-Premuzic, 2009; Soto, John, Gosling, & Potter, 2011; Specht, Egloff, & Schmukle, 2011). Soto, John, Gosling, and Potter (2011) explored mean-level age differences in Big Five personality factors among a sample of over one million individuals of ages 10-65. The results indicated greater levels of maturity and psychosocial adjustment in adult populations (age 18 – 65 years old) versus in children (ages 10 -12 years old) and adolescents (ages 13 – 17 years old). In sum, research looking at the influence of age on emotional intelligence and Big Five personality suggests a study design incorporating a longitudinal approach, or among a broader range of age groups, may have influenced the amount of variance explained.

Another important factor associated with attitudes towards teamwork is a student's previous experiences with teamwork. Students who on balance have had positive experiences or outcomes derived from working in team settings are likely to have favorable attitudes towards future team experiences (Huddleston, 2003; Rudawska, 2017). The type and organization of previous team learning experiences are important to shaping future attitudes. Research indicates student perceptions of their previous experiences working with teams are driven by a number of underlying factors. Huddleston (2003) identified factors such as perceived fairness in how projects are graded, workload distribution that mitigates the existence of "free-riders" (p.37), sufficient time set aside in class to complete teams-based assignments, and the use of peer evaluations as influencing the attitudes students have towards team learning. Rudawska (2017)

also identified the overall sense of fairness in how team projects were constructed as one of the key drivers of students' attitude towards teamwork.

Limitations of Findings

Sampling. There are limitations in interpreting the findings in this study related to the use of a nonprobability sampling method. The sample frame represents a sub-set of pre-health students (i.e., first- and second year) and is by definition not representative of the general population of pre-health students enrolled at the university. The use of purposive sampling also eliminated the ability to estimate sample error (Groves et al., 2009). Both factors make it difficult to determine the generalizability of the findings within reasonable limits.

The nature of the pre-health population potentially contributes to issues of non-response bias and variance. Pre-health students have a high number of scheduling demands from the onset of their educational experience. They have highly-varied schedules which further influences their availability. Therefore, the respondents to the survey may reflect those most available or those most interested and willing to inconvenience themselves with another task.

In addition, bias in this study is reflected in the differences in demographic representation between the sample and the overall population of enrolled pre-health students (see Table 5, Chapter Four). The differences are likely a result of the use of sponsorship (Groves et al., 2009) as a primary recruitment strategy. University units participating as sponsors included the pre-health Office, student outreach offices with Strategic Enrollment Management, and an array of health sciences focused student enrichment programs. Some of the units cater to students from specific backgrounds (e.g., underrepresented racial/ethnic backgrounds, specialized medical profession), therefore, potentially serving as an additional incentive for students to participate in the survey.

Instrumentation. A second limitation is related to instrumentation. The issue of social desirability has been associated with trait emotional intelligence measures more so than with measures categorized under the ability model (Day & Carroll, 2008). In work by Mikolajczak, Luminet, Leroy, & Roy (2007), social desirability was found to differ with respect to subfactors. The study also found differences in the correlations with social desirability along gender lines (Mikolajczak, Luminet, Leroy, & Roy, 2007). Social desirability is also a concern with Big Five (Kluemper, 2008). However, the case with Big Five measures is not as compelling (Peterson, Casillas, & Robbins, 2006). In either case, the use of a self-administered web survey should help to limit the influence of social desirability (Groves, et al., 2009).

Finally, there is limited confirmatory research available for the Value of Teams Survey, and by extension, for the subscale Value of Group Work used in this study to capture the dependent variable. Further, there was no literature found using the Value of Teams Survey in samples of undergraduate pre-health students. Therefore, caution should be taken when interpreting the results as future research is needed to confirm the validity of the measure.

Implications

Theoretical Implications

This study was guided by the theoretical framework developed in dissertation work by Crowne (2007) that explored the relationship between emotional and cultural intelligence in terms of the concepts positioning within the social intelligence domain. The implications of this study apply in three ways. First, a central assertion of Crowne (2007) is that emotional intelligence, cultural intelligence, and social intelligence are distinct concepts that have overlapping elements. According to Crowne (2007; 2009), when researching either of these variables in the context of social interactions it is important to consider the influence of the other

concepts. Guided by this recommendation, it was hypothesized that emotional and cultural intelligence would predict students' attitudes towards group work after controlling for the Big Five personality factors. Results of this study indicated emotional intelligence ($\beta = .209, p = .024$) accounted for the variance in predicting the Value of Group Work, whereas, cultural intelligence did not contribute to unique variance ($\beta = .110, p = .128$). The results are not necessarily conclusive with respect to the merits of cultural intelligence as there are studies such as those conducted by Moon (2010) that support the contention that emotional and cultural intelligence separately add value to understanding various criterion variables. Also, worth noting is the context of this study may have influenced the results as well. The focus for this study is the examination of emotional and cultural intelligence in relation only to student *attitudes* towards group learning. Early and Ang's (2003) conceptualization of cultural intelligence states its value is most prominent in situations involving cross-cultural interactions, "Culturally intelligent behaviors are external behaviors where the actors are assumed to be actively interpreting the meanings of their cultural surroundings and are motivated to appreciate, understand, and attach meanings to their responses to situational cues" (p.160). The cross-sectional study design used did not provide a context suitable for the display of cultural intelligence as prescribed according to Early and Ang (2003), nor did the use of the Value of Team Survey due to the culture-free nature of the items. As posited by Ang, Dyne, and Rockstuhl (2015), "CQ [cultural intelligence] research should focus on outcomes that are matched to the research question and focus specifically on culturally relevant outcomes (p. 291).

Secondly, this study expands the practical application of Crowne's (2007) theoretical framework. Crowne's (2007) framework focused primarily on the conceptual relationship between social intelligence, and emotional and cultural intelligence. However, the absence of

personality (e.g. Big Five, Giant Three) as a variable of interest in work done by Crowne undercuts the practical value of the framework. The findings of this study, in conjunction with extant literature, strongly indicate the influence of personality on both emotional intelligence (Lopes et al., 2004; Petrides, 2010) and cultural intelligence (Early & Ang, 2003; Li, Mobley, & Kelly, 2015) is important to getting a full picture of how individuals perform in social contexts.

Crowne (2008) later explored the antecedents of cultural intelligence and identified the important antecedents to be an individual's experiences in international settings, whether through employment or education, and the length of the exposure to diverse cultures as a result of those experiences. The literature is quite compelling with respect to the meaningful influence of personality on both emotional intelligence and cultural intelligence. Specific to cultural intelligence, we need not go further than the conceptualization by Early and Ang (2003), which views personality as a key antecedent that influences the performance of cultural intelligence in certain contexts. The importance is echoed in work by Ang, Dyne, and Koh (2006), which states Openness as one of the Big Five personality factors is considered as "...a crucial personality characteristic that is related to a person's capability to function effectively in diverse cultural settings" (p.100). Similarly, with respect to the trait emotional intelligence model it is suggested that its relevance in understanding human interactions is reliant on its relationship to personality traits (Petrides, Furnham, & Frederickson, 2004).

A third theoretical implication of this research is the expansion of emotional and cultural intelligence, and to a lesser extent social intelligence, into the health professions arena. The addition of new theories that help to explain underlying concepts such as teamwork in interprofessional settings are necessary to advance the field (Clark, 2009; Reeves & Hean, 2013).

This study has additional impact as it also examines the combination of the two concepts in a pre-health student population, which has an emerging but limited research inventory.

More broadly, teamwork is increasingly viewed as integral to creating highly reliable healthcare organizations (Baker, Day, & Salas, 2006). However, the importance of teamwork is far from being encased only within the field of education or the health sciences. “Teams are pervasive in today’s world...[w]e *need* them in our hospitals, flight decks, oil rigs, military, nuclear power plants, and a host of other organizations involved in our everyday functioning” (Salas et al., 2015). There is also a historical context for the role of collaboration and teamwork in fields such as scientific research that are commonly viewed as individualistic in nature. The topic was examined in research circles in the early 1900s with assertions that scientific publications would be exclusively co-produced by the 1980s (Wuchty, Jones, & Uzzi, 2007). Similarly, teamwork and collaboration are valued as a skill set among employees in terms of their ability to collectively respond to rapid changes in the industry (Liu, Liu, Ding, & Lin, 2015).

With the broad interest and emphasis on collaboration and teamwork across professions, there are opportunities to extend the concept of interprofessionalism across those varied industries to arrive at a transdisciplinary framework for understanding underlying factors influencing teamwork, assessing individual teamwork competencies and group performance, and training individuals for more effective performance in team situations. The implications of having a framework that melds various discipline principles and competencies is important as healthcare is currently fused with other disciplines such as the arts (Lazarus & Rosslyn, 2003), business (Kassirer, 2007), social sciences (Eisenberg & Kleinman, 2012), and technology (Blumenthal & Glaser, 2007). The implications of a transdisciplinary teamwork framework also

apply to prehealth student populations, particularly minority students, as they have a high attrition rate and often pursue other career options (Alexander, Chen, & Grumbach, 2009).

Policy Implications

“[P]olicy does not become a public policy until it is adopted, implemented, and enforced by some government institution” (Dye, 2002, p.12). Such is the case with the interprofessional education project and its desire to improve healthcare through preparing health professionals to work more collaboratively (Knebel & Greiner, 2003). This study has implications for advancing the policy agenda for interprofessional education on, at minimum, two levels. First, the study has implications for future funding of interprofessional programs. Funding for interprofessional education initiatives occurs primarily at the federal level, the prime entity being the U.S.

Department of Health and Human Services. Initiatives that fall under the Interdisciplinary, Community-Based Linkages portfolio provided more than \$73M in funding in Fiscal Year 2015. An additional \$10M under that portfolio was requested in the Fiscal Year 2016 President’s budget (Department of Health and Human Services, 2017). The policy implications in this sense are focused on expanding the requirements of grantees, where appropriate, to further explore the potential impact of non-cognitive factors such as emotional and cultural intelligence toward achieving policy aims.

Second, there are implications for the U.S. Department of Health and Human Services (DHHS) workforce development policy agenda. Policies that address issues of demographic representation in the healthcare workforce and provider distribution are linked to grants and contracts under Title VII of the Public Health Service Act (Title VII). Overall, Title VII seeks to provide more quality and accessible healthcare to individuals in medically underserved and vulnerable communities within the United States. The programs funded under Title VII include

short-term enrichment programs, which employ interventions that include academic enrichment, remediation, mentoring, and counseling designed to increase students' chances of admission to health profession programs (Grumbach et al., 2003). These programs are hosted at colleges and universities across the United States. As such, they offer opportunities to both expand the research capacity and practical application of emotional and cultural intelligence, as well as other non-cognitive factors, across different educational, geographical, and cultural settings. A robust warehouse of information can develop from a focused policy and funding agenda seeking to illuminate the role of non-cognitive factors in the preparation of health profession students.

Private health foundations contribute significantly to advancing interprofessional education as well. Organizations such as the Robert Wood Johnson Foundation and Josiah Macy Jr. Foundation are major healthcare foundations and are prolific funders of initiatives that support interprofessional education (Barnsteiner, Disch, Hall, & Mayer, 2007). Through their funding and overall advocacy, private foundations shape the national discussion with respect to interprofessional education. Moreover, these organizations have strengthened their collaboration (Reich, 2002) and can better leverage their capacity to convene organizations from around the nation. The collective efforts of the organizations can be used to create a nationalized research agenda that utilizes their respective conference programming to explore the influence of non-cognitive variables such as emotional intelligence on interprofessional concepts such as team performance and team functioning.

In addition, this study also has implications for the development of strategic and operational guidelines (e.g., core competencies) that drive the implementation of interprofessional education programs. The transition from policy to implementation offers rich opportunities for this research to resonate with stakeholder organizations such as the

Interprofessional Education Collaborative (IPEC). IPEC has provided the interprofessional education community with a framework that helps to transform interprofessional education policy into practice (Schmitt et al., 2011). As interprofessional education programs have emerged in universities across the country, there is potential to connect this research into an existing ecosystem fueled by national and local conferences and symposia that inform the discourse on fostering teamwork. A case in point, the Robert Wood Johnson Foundation hosted a conference in 2011 featuring experts from across the federal, state, and health care industry, to include IPEC. A purpose of that meeting was to outline recommendations for improving teamwork in education and clinical practice (Interprofessional Education Collaborative, 2011). It is likely that an examination of IPEC core competencies will continue, thus opportunities would exist to incorporate, or at minimum emphasize, the importance of non-cognitive factors in advancing interprofessional education. Initially, efforts towards understanding the implications of non-cognitive factors would focus on how those factors are appropriately positioned and assessed within the context of the core competencies. A recommendation would be to build on the work by Dow et al. (2014), in which the researchers developed a 42-item self-assessment survey based on the core competencies put forth by IPEC (2001). The tool was later refined by Lockeman et al. (2016) using a multi-site, multi-study approach. The resulting tool remained psychometrically sound and consisted of 16 items positioned under two domains – Interprofessional Interaction Domain and Interprofessional Values Domain (Lockeman et al., 2016). As the new tool gains appeal within the interprofessional education arena an opportunity exists to include non-cognitive factors such as emotional intelligence or Big Five personality factors as control- or criterion variables. The approach could possibly inform future efforts to develop interventions that target specific competencies.

In sum, policy actors and stakeholder organizations provide platforms for introducing new knowledge regarding advancing the aims of interprofessional education. An iterative process predicated on building a sound evidentiary base increases the likelihood that an emphasis develops regarding the role that emotional intelligence and cultural intelligence can play in fostering teamwork among aspiring and current health professionals. Provided this research achieves a national voice, it may be possible to penetrate the decision-making processes that shape future policy development, funding requests, and guidelines that support interprofessional education.

Practical Implications

A central focus of this study is to address the lack of research addressing factors that influence the attitudes of students towards team learning. The extant literature highlights a debate regarding at what point, and to what extent, undergraduate students should be exposed to interprofessional education experiences (Hoffman & Harnish, 2007; Anderson & Thorpe, 2008). Findings from the literature thus far have demonstrated that the early introduction of health profession students to team learning can help to mitigate the negative impacts of professional identity often taking the form of stereotypes regarding the role and importance of other professions (Cooper, Spencer-Dawne, & Mclean, 2009). Specifically, team learning helps students to appreciate the capabilities and contributions of other health professions and to place the role of their own profession in a broader context (Cooper, Spencer-Dawne, & Mclean, 2009). Other research suggests benefits within pre-health student populations in terms of influencing their attitudes towards team learning (Hockings, DeAngelis, & Frey, 2008; Dumke et al., 2016).

This study also has implications that can influence the preparation of pre-health student populations. Two areas that can be advanced with further exploration of these findings are the

work of pre-health advisors in guiding student preparation for health careers, and the work of health professions enrichment programs that aim to strengthen students' personal, academic, and experiential profiles.

Pre-health advisors play a critical role in preparing students for health profession careers (Harris, 2005) and have a unique opportunity to explore the relevance and impact of non-cognitive factors in their advising programs. In many cases, student advisors are likely to have the most intensive and frequent engagement with students (Hunter & White, 2004).

Health profession enrichment programs (pipeline programs) provide an additional opportunity for further exploration of this research. Many students from minority, first generation, and socioeconomically challenged backgrounds participate in pipeline programs hosted by universities across this country (Grumbach & Mendoza, 2008). Pipeline programs are designed to prepare students for practice in the current and future health careers marketplace (Dumke et al., 2016). Federal and private foundation funding have recently refocused their direction towards preparing students to work interprofessionally (Brandt, 2015). Further, recent funding requests from the U.S. Department of Health (DHHS) and Human Services and the U.S. Department of Education (DoEd) have emphasized the importance of social and emotional factors in the preparation of students for health careers. For example, the DoEd has incorporated non-cognitive components in recent grant announcements. They state the impetus for inclusion of social and emotional components in grant requests is based on compelling evidence that non-cognitive factors are influential to student success (Department of Education, 2015). In essence, these programs serve as laboratories for research and practical application to examine the impact of non-cognitive factors on pre-health student development. An effective infusion of this line of research within the network of pipeline programs can hasten the understanding of how a

student's emotional intelligence, and potentially other non-cognitive factors, interfaces with expectations placed on them to be more team-oriented.

In light of the pace and importance that the health professions industry is committing to collaborative models of education and practice, it is plausible to think that teamwork skills will ascend to one of, if not a paramount, attribute expected of health profession students and practitioners. The importance of preparing individuals along the continuum of health education and healthcare was addressed by Cooke, Irby, Sullivan, and Ludmerer (2006) in arguing for revising the Flexner Report,¹⁶ which set the foundation for how physicians were trained over a century ago. Consequently, prehealth advising programs and pipeline programs will be *required* to undergo transformation their delivery of support services to prehealth students. Social media is an emergent, and potentially disruptive, technological dynamic in higher education. Earlier work by Rosmala (2012) found more than 60% of faculty and students from three universities utilized social media platforms (e.g. Facebook, Twitter) in teaching and learning activities. Another study by Hussain (2012), using a sample of 600 college students, found 90% used social media platforms for academic activities. More directly related to academic advising, Amador and Amador (2013) explored the potential of Facebook as a platform for administering prescriptive advising strategies among six undergraduate college students. The students expressed satisfaction with the use of social media for specific advising activities and positive attitudes towards its potential in other advising scenarios (Amador & Amador, 2013).

The apparatus to facilitate such transformation currently exists. There are a number of training and professional development platforms offered by the National Association of Advisors

¹⁶ Abraham Flexner created a report in 1910 based on the assessment of more than 150 medical schools that became the blueprint for medical education programs for the past century. The Flexner Report emphasized the need for a scientific-based approach to designing medical school curriculum (Cook et al., 2006).

for the Health Professions that expose pre-health advisors to new strategies and research (Oyewole, 2001). The infusion of this research into the professional development and training apparatus for pre-health advisors could expand the available tools advisors use to more effectively address the individual needs of students within the context of traditional advising models and within a virtual, high-technological space. Further, pipeline programs are ideal for developing e-Teamwork models that both extend the benefits of the respective programs beyond the on-site participation and to do so in a manner that continues to foster effective teamwork skills.

Recommendations

This study reflects an early exploration into the role non-cognitive factors, emotional and cultural intelligence, could have in fostering teamwork among aspiring and current health profession students. The overarching aim of the recommendations that follow is better developed pre-health students equipped for the expectations and demands of team learning in a future interprofessional education experience. These expectations and demands are codified in a core set of competencies (IPEC, 2011) that drive the development and implementation of interprofessional education programs across the country. A subset of the IPEC competencies are listed below. They are illustrative of the degree of engagement and interactions expected of students throughout their education (and professional) experience as institutions continue operationalizing these competencies.

Values/Ethics for Interprofessional Practice

- “VE3. Embrace the cultural diversity and individual differences that characterize patients, populations, and the health care team” (p.19).

Roles/Responsibilities

- “RR3. Engage diverse healthcare professionals who complement one’s own professional expertise, as well as associated resources, to develop strategies to meet specific patient care needs” (p.21).

- “RR6. Communicate with team members to clarify each member’s responsibility in executing components of a treatment plan or public health intervention” (p.21).
- “RR7. Forge interdependent relationships with other professions to improve care and advance learning” (p.21).
- “RR9. Use unique and complementary abilities of all members of the team to optimize patient care” (p.21).

Interprofessional Communication

- “CC7. Recognize how one’s own uniqueness, including experience level, expertise, culture, power, and hierarchy within the healthcare team, contributes to effective communication, conflict resolution, and positive interprofessional working relationships ([found in] Toronto 2008)” (p.23).
- “CC8: Communicate consistently the importance of teamwork in patient-centered and community-focused care” (p.23).

Teams and Teamwork

- “TT6. Engage self and others to constructively manage disagreements about values, roles, goals, and actions that arise among healthcare professionals and with patients and families” (p.25).
- “TT8. Reflect on individual and team performance for individual, as well as team, performance improvement” (p.25).
- “TT11. Perform effectively on teams and in different team roles in a variety of settings” (p.25).

Provided below are recommendations that are informed by, and are within the scope of, the results of this study. In sum, they provide a multifaceted approach to understanding factors that shape the attitudes students have towards working in groups. Specifically, the following recommendations propose opportunities to expand the current body of literature related to factors influencing attitudes towards teamwork; inform policy-making and implementation; and provide a potential blueprint for programs that seek to prepare students for health profession careers.

Recommendations for Policy Actors

Federal agencies and private healthcare foundations have the unique ability to focus the attention of universities on specific topics and to subsequently drive their behavior as they seek funding to implement initiatives such as interprofessional education programs. This

recommendation proposes leveraging the unique funding capability of these entities to further examine the role of factors such as emotional intelligence in fostering teamwork competencies in students along the educational continuum.

Agencies such as the U.S. Department of Health and Human Services (DHHS) and U.S. Department of Education (DoEd) are prominent governmental agencies involved in shaping the future healthcare workforce through policies designed to ensure quality health care exists for all citizens across this nation. In addition, private, non-profit healthcare foundations such as the Robert Wood Johnson Foundation are engaged in both influencing policy and sponsoring programmatic activities that are effective at mobilizing policy actors, health professions educators, and practitioners towards emerging innovations and best practices in training and care delivery. Moreover, these organizations have an extensive history of funding initiatives that fostering greater racial and ethnic, socioeconomic, educational, and geographical diversity in the health professions workforce (Grumbach et al., 2003).

One recommendation is that federal agencies and the non-profit healthcare sector establish a national, collaborative initiative focused on understanding the impact of non-cognitive variables such as emotional intelligence on the attitudes towards teamwork of students, faculty, and health professionals. The implementation model could follow a strategy used by a funding collaborative consisting of major private foundations¹⁷ to address multiple needs within the dental practice and education domains (Bailit et al., 2005). The Pipeline, Profession, and Practice: Community-Based Dental Education program (Dental Pipeline) funded 15 sites with requirements to deploy grant funding and institutional resources to meet stated program

¹⁷ Dental pipeline funding collaborative consisted of The Robert Wood Johnson Foundation, California Endowment, and W.K. Kellogg Foundation. Found in Bailit, H. L., Formicola, A. J., Herbert, K. D., Stavisky, J. S., & Zamora, G. (2005). The origins and design of the dental pipeline program. *Journal of dental education*, 69(2), 232-238.

objectives. The sites were required to work as a collective to move the needle on programmatic areas as defined in the proposal. A similar level of effort and intentionality among a cluster of universities currently invested in interprofessional education could accelerate the knowledge-base and programmatic options available. This recommendation aligns with research recognizing the importance of a health professional's emotional and social intelligence in providing patient care (Freshwater, 2004; Flowers et al., 2014) and in interprofessional settings (McCallin & Bamford, 2007; Anderson, 2012; Flowers et al., 2014). A potential outcome of a national laboratory approach among funded programs could be the development of a competency framework – patterned after IPEC core competency framework - that is specific to pre-health student populations.

Further downstream, there should also be a parallel effort to introduce the topic of non-cognitive factors in organizations that influence the priorities of interprofessional programs that educate and train the future healthcare workforce. These efforts can be included in a broader research agenda addressing the continued absence of evidence linking the benefits of interprofessional education to the health outcomes of patients (Reeves et al., 2013). The emphasis on interprofessional collaboration over recent years has resulted in a rich body of evidence supporting the benefits of *interprofessional practice* on patient outcomes and their experiences, however, there remains much to learn,

“Interprofessional collaboration improves patient care, especially for those patients with complex and/or chronic conditions, but interprofessional collaboration is far from integral to everyday primary care practice. A range of individual and contextual factors influencing collaborative practice in primary care settings have now been documented, yet identification of the essential elements of effective interprofessional collaboration in this setting remains obscure.” (Morgan, Pullon & McKinlay, 2015, p.1218).

The National Center for Interprofessional Practice and Education (NCIPE) is a lead organization that guides policy, research, and implementation of interprofessional education programs in health profession schools (Brandt, Lutfiyya, King, Chioreso, 2014). The NCIPE is supported financially through a collaborative public and private partnership consisting of organizations such as the DHHS, Josiah Macy Jr. Foundation, and The Robert Wood Johnson Foundation. The specific recommendation, or rather, intention for NCIPE is to gain visibility for an investigation of the role of non-cognitive factors in enhancing interprofessional education. A potential avenue is the organization's Nexus Summit, which focuses on exploring new ideas with respect to developing interprofessional practice and education strategies. As an example of the potential of this vehicle for furthering this research, according to the organization's conference promotions for 2017 a presentation is scheduled focused on, "Improving the Health, Well-Being, and Resilience of Health Professionals Within and Beyond Education"¹⁸. The inclusion of this topic is likely driven by the recent call for more attention on the well-being of health professionals (Bodenheimer & Sinsky, 2014). However, it can also signal an avenue within which the organization could focus further upstream on the influence of non-cognitive factors such as emotional intelligence in preparing students to enter the health professions.

Recommendations for Preparing Pre-health Students for Team-based Learning

The results of this study indicated emotional intelligence explains a degree of variance above a student's demographic and personality factors in relation to assessing student attitudes towards group learning. The study results also suggest pairing emotional intelligence with the Big Five personality factors provides a more comprehensive understanding of student attitudes towards learning in groups. However, the results also indicated that the consideration of all the

¹⁸ <https://nexusipe.org/nexussummit/2017/plenary-sessions>

variables included in the analysis only explains about 22% of the variance in the criterion variable. From a practical perspective, the latter result cautions against overstating the importance of these results. Therefore, the following recommendations, while prescriptive in tone, acknowledge the continued need for further exploration of the study variables and of broader factors and delivery platforms to include social media and web-based curriculum delivery.

Pre-health Advising Programs

The objective of this recommendation is to expand the tools used in pre-health advisor programs to include assessments, courses, and program interventions focused on building students' emotional intelligence skills in the context of teamwork and interprofessional learning. An additional focus of this recommendation is to equip and empower students to employ their unique set of personal attributes as assets in team settings. This approach borrows from work by Dr. Christine Johnson, author of *Finding Your Way: Navigating Life by Understanding Your Learning Self*, in which she characterizes the process of individuals using their unique learning patterns to their benefit as finding your "Compass Rose" (p.13).

As stated, pre-health advisors play a primary role in the preparation of pre-health students for admission to health profession programs. They employ a variety of methods in executing their roles to include one-on-one advising, group advising, formal introductory courses, workshops and seminars. They also draw from a variety of advising models to include appreciative advising (Hutson, 2010), developmental advising (King, 2005), prescriptive advising (Lowenstein, 2005), and intrusive advising (Williams, 2007). There are also developments in the broader field of higher education research and practice domains trending towards concepts such as personality (Mottarella, Fritzsche, & Cerabino, 2004), self-efficacy

(Young-Jones, Burt, Dixon, & Hawthorne, 2013), and academic grit (Perez, 2015) as factors that influence student success.

The following proposed steps provide a beginning framework for pre-health advisors to utilize in interacting with students in various settings in light of research indicating “[t]he more practice students get developing their emotional intelligence, the more they will build neuronal pathways to ensure that effective behaviors become more natural” (Kanoy, 2014, p.2). Prior to engaging in the following pedagogical and experiential approaches, a number of administrative steps should be taken to strengthen and sustain efforts.

Administrative Steps

- Acquire the necessary support from program leadership to incorporate a focus on developing students’ teamwork skill sets as there are likely trade-offs in pre-health advisor workloads and budget to accommodate new interventions.
- Identify resources on campus that can train pre-health advisors to administer and interpret emotional intelligence and personality measures as selected by the advising office. If the option is not possible, establish a formal relationship with said resources to provide these services.
- Administer an assessment(s) to all registered (known) pre-health students that obtains, at a minimum, their emotional intelligence and personality profile. The TEIQue (full or short version) is preferred, however, either of the trait emotional intelligence scales would suffice. Likewise, the use of a Big Five measure is preferred as it has added value in terms of its broad use and validation within the research literature. The mass administration of the measures to the population of pre-health students both creates awareness of the concepts and provides a common baseline for future advisor-student

interactions. There may also be avenues to use an emotional intelligence assessment (Luca & Tarricone, 2001) and personality assessment (Morgeson, Reider, & Campion, 2005) as diagnostic tools to identify students who may not perform effectively in team-based situations. The purpose of a diagnostic approach is to direct students to the most appropriate developmental resources versus being used as a screening device to eliminate students from use of advising resources. This approach would likely require collaboration with a faculty or consultant versed in interpreting assessments (e.g., educational psychologists) as normed-scores based on the population of students in the advising pool would be needed to indicate low and high levels of performance (Blanton & Jaccard, 2006).

- Associated with the previous recommendation, trends in advising are moving towards the use of student contact management systems to more accurately monitor the impact of advising, hold students accountable, and assess advisor workload (Feghali, Zbib, & Hallal, 2011). Where possible, these systems should be modified to include areas designed to capture or report feedback given to students specific to teamwork assessments and competencies. This information would then be available for use in generating recommendations on the students' behalf when applying for admissions to graduate or professional health sciences programs.
- Provisions should also be made for students who demonstrate a lack of buy-in to the additional process activities, or show resistance to embracing the concepts (i.e., emotional intelligence, personality factor). A certain level of engagement of the concepts would be expected in formal courses. However, it is recommended that flexibility be

given in those situations, and other advising-related situations, to avoid or mitigate creating negative attitudes towards teamwork that would occur through association.

Proposed Interventions/Activities

Courses. Pre-health advisors often use introductory level courses as a primary means of providing general advice to a large group of students so that specialized advising services can be provided to students who are closer to applying to health professions programs (A. Edwards Harris, personal communication, September 20, 2017). The use of these courses typically includes career exploration opportunities or general information on topics such as admissions to health profession programs or financing a health profession degree (S. Lamb, personal communication, September 15, 2017).

Kanoy (2014) found emotional intelligence interventions to have been effective when incorporated into traditional courses. Therefore, pre-health advisors are encouraged to also create courses that are focused primarily on building team learning skills. The course(s) should incorporate components addressing the role of their emotions and personality in working in team learning settings. As discussed in Michaelsen and Sweet (2008), diligence should be given to forming small (5-7 students), diverse groups based on as wide a range of demographic attributes as possible. Borrowing from work by Brown (2003) a suggested pedagogical framework includes activities that provides 1) an overview of emotional intelligence and personality characteristics and how they might impact an individual's behavior; 2) exercises using healthcare-related case studies in which emotions and personality responses are a focal point of critical reflective discussions; and, 3) activities that utilize role-playing based on small group scenarios as a means of engaging students in the application of emotional intelligence skills in real-time response situations.

Workshops/Seminars. Pre-health advisors frequently offer workshops and seminars to focus on developmental topics such as time-management and standardized test-taking. The seminar format is also often used to present students with information from current health professionals or health profession students. These opportunities are typically highly interactive and offer opportunities to have presenters share their perspectives and experiences with team learning (or practice), as well as share insight on how their emotional states and personality attributes color those interactions.

One-on-one advising meetings. Scheduled one-on-one meetings with students are a common practice among pre-health advising programs, however, programs differ in terms of how often the meetings occur and to which students are eligible. For example, the pre-health program at the university examined in this study provides one-on-one meetings primarily for sophomore and junior-level students once a semester. Although varied and possibly limited, these meetings offer an opportunity to “encourage” students to engage in culturally diverse, group learning experiences as a means of providing stimuli for future assessment and development of their effectiveness in these settings. Additionally, through the use of journaling students can also be encouraged to reflect on their emotional intelligence skills and how their personality profile may impact their performance in those settings.

Service Learning Experiences. Pre-health advisors can capitalize on the growing interest in service learning. These opportunities impact only a subset of pre-health students, but nonetheless provide an avenue for those students to develop their emotional intelligence and teamwork skill sets. Service learning is “a pedagogy that is grounded in experience as a basis for learning and on the centrality and intentionality of reflection designed to enable learning to occur” (Enos & Morton, 2003, p.5). Service learning pedagogy is primarily utilized within the

health professions education arena (Hood, 2009) to educate students on issues such as diversity and community engagement (Hoppes, Bender, & Werner, 2005), cultural competency (Flannery & Ward, 1999), and issues such as social justice (Redman & Clark, 2002). The critical reflective methods described previously (Hoppes, Bender, & Werner, 2005; Hood, 2009) can be used to help deepen the students' understanding and application of their emotional intelligence as they pursue other service learning experiences.

In addition to building the pre-health advisor toolkit, another area of opportunity involves using the national and regional professional development conference apparatus of the NAAHP to further explore these topics. The importance of the NAAHP on the professional development of pre-health advisors is well documented. The NAAHP hosts a national conference that provides pre-health advisors with professional development opportunities, as well as showcases innovations in advising. In addition, there are regional conferences that likewise provide advisors with professional development and training (Oyewole, 2001). The conference structure provides a national platform to unpack concepts such as teamwork and interprofessional learning in health education. More importantly, the conference structure is a vehicle to advance both research and interventions on the role of emotional intelligence and other non-cognitive factors in equipping pre-health students for working in teams. The frameworks explored should include a focus on how these factors manifest within tradition, in-person team situation and in virtual team situations.

Health Profession Pipeline Programs

Health profession pipeline programs are another resource available to pipeline students and they offer a different set of options for exploring interventions. The objective of this recommendation is to utilize health profession pipeline programs to develop and assess

interventions that strengthen students' emotional intelligence skills within the context of teamwork and interprofessional learning. Pipeline programs are in an ideal position to investigate the potential impact of emotional intelligence, and other non-cognitive factors, on pre-health students' attitudes regarding teamwork. Pipeline programs that focus on student preparedness have a typical duration of 4-10 weeks and are primarily offered in the summer months. The typical length of pipeline programs provides an ideal setting for pre- and post-assessments of interventions. Further, the programs often have greater flexibility to “experiment” with interventions that have been examined in the research literature. The following steps provide a framework for pipeline programs to incorporate a focus on influence of emotional intelligence and other non-cognitive factors within the context of group learning.

Administrative Steps

- Develop a pre- and post-test research protocol that features administering one of a number of trait emotional intelligence measures and Big Five personality measures prior to the start of the program experience (or prior to teambuilding exercise) and prior to the participants departing. The information should be collected in a format suitable for future analysis. This information can also be discussed with students at the conclusion of the program to help identify potential developmental strategies.
- Develop a program intervention that focuses on group learning utilizing a case-based pedagogy. Dumke et al. (2016) provides a brief description of a case-based pedagogy implemented in a pipeline program.
- Develop a workshop during the orientation period that provides an overview of concepts such as emotional intelligence and personality characteristics to provide a grounding and

baseline literacy that will facilitate participation in the interventions and activities described in the next section.

Proposed Interventions/Activities

- Require all program participants to maintain a journal to record meaningful events and interactions throughout the course of the program. Preferably, provide guidelines or a template with questions that focus participants' attention on the implications of their emotional responses and personality influences.
- Utilize a critically reflective pedagogical framework to accompany case-based activity to further deepen participants understanding of how their emotional intelligence and personality profile influence their attitudes and behaviors in culturally diverse team-learning situations. An efficacy framework is recommended for implementation of these activities with the intent of the students are encouraged to embrace the uniqueness and advantages, particularly of their personality profiles, in advancing personal and team learning goals.

Technology-based Teamwork Module: e-IPETeamwork

The overarching aim of this recommendation is to understand and incorporate non-cognitive factors such as emotional intelligence and personality attributes in web-based virtual learning teams as outlined in Dow et al. (2016). The implementation of this recommendation requires establishing partnerships between prehealth profession programs, pipeline programs, and interprofessional education programs. This recommendation can potentially be leveraged into an e-IPETeamwork¹⁹ assessment module that accompanies the virtual team system (Dow et

¹⁹ This concept is a derivation of the e-learning concept defined as “the use of computer network technology, primarily over an intranet or through the Internet, to deliver information and instruction to individuals...” (Welsh, Wanberg, Brown, & Simmering, 2003).

al, 2016). The e-IPETeamwork module could consist of intentional reflective exercises focused on assessing non-cognitive factors that students engage at various points prior, during, and following assigned coursework. The additional data would strengthen the current efforts by Dow and colleagues (2016) to correlate the students' individual and team-focused behaviors with process (e.g., team formation) and outcomes metrics (e.g., message posts, message replies).

Recommendations for Future Research

The findings from this study, as well as the pursuit of it, introduce an opportunity to further address the complex questions of what specifically makes an effective learning team and good team members. At best, the study furthers the ongoing debates with respect to the value that emotional and cultural intelligence add beyond personality traits. As such, there are opportunities for future research that explores the impact of emotional intelligence and cultural intelligence on fostering greater teamwork among students. While this study provided promising results, further research is warranted with respect to the performance of emotional intelligence, cultural intelligence, and the broader implications of social intelligence within team-learning settings. This examination should include a focus on the role of subfactors in each of these concepts in relation to other important concepts such as personality and self-efficacy.

As well, a specific and more thorough examination of cultural intelligence is warranted. The results of this study suggest a combination of the Big Five personality factors and emotional intelligence is most relevant in predicting student attitudes towards working in teams. It would be interesting to examine the potential influence of cultural intelligence in a study design that features social interactions among culturally diverse individuals. Additionally, there is substantive literature examining the cultural implications that are inherent in interprofessional education and practice (Purden, 2005; Baker, Pulling, & McGraw, 2008; Pecukonis, Doyle, &

Bliss, 2008; Hamilton, 2011; Hawala-Drury & Hill, 2012; Reeves et al., 2012). With the exception of work by Davis et al. (2014) that examined the influence of cultural intelligence among interprofessional education faculty, there was no literature found that focused on the cultural intelligence of student learners in interprofessional settings.

Related to implications of cultural intelligence, research shows structural diversity plays a role in helping to shape and influence collaborative learning teams (Shaw E. J., 2005; Purden, 2005). The interaction of students, particularly students from minority backgrounds, is shaped by the students' salient identities. Sargeant (2009), asserts that interprofessional education involves new ways of learning with emphasis on the social and environmental context. The relevance here is in relation to one's social identity. Social identity theory was introduced by Henry Tajfel (Tajfel, 1982) "... as a shorthand term used to describe [1] limited aspects of the concept of self which are [2] relevant to certain limited aspects of social behavior" (1982). Social Intelligence Theory captures that part of an individual's self-concept in relationship to their knowledge of their membership in a social group. Embedded within the self-concept is one's assignment of value or emotional importance to being a member of the group (1982). Within this context, a deeper understanding of cultural dynamics inherent in collaborative learning environments is important. Research is needed to craft complimentary teams, as well as to developing appropriate strategies to monitor interactions of members toward fostering positive team outcomes.

Additionally, a subscale of the Value of Teams survey was used to capture students' attitudes towards group learning. However, the measure lacks confirmatory validity according to the literature reviewed. A more rigorous examination of the Value of Teams measure would add to the current body of literature on team learning, as well as potentially expand the list of

assessments available to faculty seeking to improve student attitudes towards team learning in both the pre-health and interprofessional contexts.

Finally, there will be a continued evolution of the use of technology in both interprofessional education and practice settings. Dow et al. (2016) has made progress in assessing student behaviors with respect to team performance in a virtual team-oriented course. How can this foundation be expanded to include components of the Web-based virtual case system to capture how students are impacted by various non-cognitive factors in terms of shaping their attitudes and behaviors in virtual team settings? This extends to the broader field of education and the intersections and tensions between the continued rapid development of on-line education, and the imperatives of building students' teamwork and collaboration competencies to prepare them for a global market-place? The pervasiveness of social media in higher education has limitless possibilities in teaching and learning (Falaha & Rosmala, 2012), and on expanding the scope of student interactions to a world-wide "Virtual Community" (Hussain, 2012, p.639). What are the implications for teamwork and collaboration, particularly in advancing interprofessional collaboration? Further complicating the issue, how will factors such as emotional intelligence and personality influence (or be influenced by) teamwork and collaboration in virtual spaces? Equally important, what are the consequences? As raised by Hartley and Bendixen (2001), are there inherent inequities associated with the use of on-line education in relationship to student individual attributes? And, is there the possibility that "[w]hile we may have succeeded in improving access to all, we have only succeeded in increasing access to learning for a few" (Hartley and Bendixen, 2001, p.24).

Conclusion

Health profession students are expected to obtain competencies needed for interprofessional, team-based learning and team-centered patient care. However, there is a need for more research focused on understanding the attitudes health profession students have towards teamwork and interprofessional education (Leipzig et al., 2002). This exploratory study advances the understanding of factors that can facilitate the success of students achieving the required competencies and factors that shape their attitudes towards working in groups at an early stage in their educational experience. Moreover, the study furthers the significant amount of literature on emotional intelligence, as well as introduces the concept of cultural intelligence, in a health sciences context.

In total, the results of this study and recommendations argue the case for a broad and holistic approach to understanding factors influencing students' interest and performance in team learning environments. Understanding these factors is also beneficial as health sciences students pursue greater roles of leadership and influence in their learning experience. Students are increasingly pursuing having greater input in crafting interprofessional education curriculum, experiential opportunities, and conducting student-led initiatives such as interprofessional peer teaching activities, and student organizations (Hoffman, Rosenfield, Gilbert, & Oandasan, 2008). As expressed in VanderWielen et al (2013), "...[w]ith continued institutional support, such innovative student-led organizations can help meet the need for interprofessional education..." (p.2).

The study offers a systems approach that provides a number of practical steps that can be implemented at the national and university level. As interprofessional collaboration continues to evolve so will the inherent challenges of sustaining effective, high-performing healthcare teams.

For the foreseeable future, students will more than likely enter a health profession workforce still grappling with the vestiges of professional hierarchy (Baker, Egan-Lee, Martimianakis, & Reeves, 2011) and professional cultures (Hall, 2005) that shape how practitioners value themselves and others. They will also enter a maturing, yet ever-evolving virtual space with parallel evolving expectations and expressions of teamwork and collaboration. As asserted in D'eon (2005), "Learning must prepare students for the real world in which they will work. If that involves teams of health professionals working together, then learning needs to model and teach skills that contribute to that goal in increasingly realistic and complex representations" (p.54).

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APPENDICES

Appendix A: Definition of Terms

Big Five Trait Taxonomy (Big Five Personality Dimensions). A taxonomy of personality traits, often referred to as the Big Five (John, Naumann, & Soto, 2008, p. 116). A taxonomy provides a structured means of interpreting an individual's behavioral and experiential differences. Big Five theorists do not suggest that the five personality factors encompass all of an individual's differences. Conversely, the Big Five represents a broader labeling that further consists of a subset of personality traits. Thus, the Big Five taxonomy describes five broader factors of personality characteristics that include (John et al., 2008):

Extraversion reflects a level of energy in how one interfaces with the social and physical aspects of their surroundings. Inclusive of traits such as assertiveness, positive emotional expression, and sociability.

Agreeableness reflects a “prosocial and communal orientation” that includes traits such as modesty, altruism, and trust (John et al., 2008, p. 120).

Conscientiousness is described as “socially prescribed impulse control [italics removed] that facilitates task- and goal-directed behavior” (John et al., 2008, p. 120). It includes traits such as delayed gratification, planning, organizing, and prioritization.

Neuroticism “[c]ontrasts emotional stability and even-temperedness with negative emotionality” (John et al., 2008, p. 120). It is inclusive of nervousness, anxiety, and tension.

Openness reflects the “breadth, depth, originality, and complexity of an individual's mental and experiential life” (John et al., 2008, p. 120). An example is someone who learns a new skill or information for the sake of learning.

Culture. “[A]n inter-related series of more or less clear-cut modes of thought, feeling, and action acquisition of which makes people specific and distinguished (Soltani & Keyvanara, 2013, p.40).

Cultural competence. “Cultural competency is an umbrella term to mean effective intercultural behavior” (Ang, Rockstuhl, & Tan, 2015, p.6)

Educational Diversity. In an education context, Gurin (2012) provides a concept of diversity that is parsed into three components:

- Structural Diversity – “... refers primarily to the racial/ethnic composition of the student body. Increasing the numerical representation of various racial/ethnic and gender groups is the first essential step in the process of creating a diverse learning environment.”
- Classroom Diversity – “... the incorporation of knowledge about diverse groups into the curriculum that colleges and universities present to this more diverse array of students.”
- Informal Interactional Diversity – “...the opportunity to interact with students from diverse backgrounds in the broad, campus environment”.

Intelligence. “Intelligence comprises the mental abilities necessary for adaptation to, as well as shaping and selection of, any environmental context” (Sternberg, 1997, p.1030).

Interdisciplinary. “[C]oncerns the development of integrated knowledge in response to fragmented disciplinary knowledge” (D'Amour & Oandasan, 2005, p. 8).

Interprofessional cultural competence. An extension of the concept of cultural competence that “involves a set of congruent behaviors, attitudes, and policies that come together in a system, agency, or among professionals that enables the system, agency, or those professionals to work effectively in cross-cultural situations” (Pecukonis et al., 2008, p. 422).

Personality. “A branch of psychology which is concerned with providing a systematic account of the ways in which ways individuals differ from one another” (Wiggins, 1979, p. 395). Personality is thought to reflect our “human nature” and “individual differences” (Buss, 2008, p.29),

Pre-health profession students. Undergraduate college students who are engaged in a program of study and intent on pursuing a career in the health professions such as Medicine, Dentistry, Nursing, or Allied health. These students have not been enrolled previously in a health professions education program (Hoffman & Harnish, 2007).

Social identity theory. Social identity theory was introduced by Henry Tajfel (1982) as that part of an individual's self-concept in relationship to their knowledge of their membership in a social group (Tajfel, 1982). The influence of one's social identity within a group is said to alter one's behavior in the group (Trepte, S., 2006).

Traits. Traits are constructs that are “inferred or abstracted from behavior” (Mischel, 1973, p.262)

Appendix B: Pre-health Attitudes Towards Team-based Learning Survey

Confidential

Page 1 of 11

Prehealth Student Survey MAIN

Dear Student:

Please complete the survey below. It will take approximately 15-20 minutes. It's preferred you complete it in one sitting, however, you can "Save & Return".

Please click the "Next" button to advance if questions don't appear automatically. Click the "Submit" button only when you have completed all sections. If you choose not to continue, merely close the browser. At the end of the survey you will be asked whether you choose to be included in the available incentives.

If you have questions at any time about the survey or the procedures, you may contact the Study Administrator: VCU Survey and Evaluation Research Laboratory, Email: serl@vcu.edu or phone: (804) 827-4226.

Thank you!

ELIGIBILITY AND CONSENT

- | | |
|--|---|
| I am 18 years or older as of today | <input type="radio"/> Yes <input type="radio"/> No |
| Enrolled as a full-time student? | <input type="radio"/> Yes <input type="radio"/> No |
| Currently classified as a Freshman OR Sophomore? | <input type="radio"/> Yes <input type="radio"/> No |
| Great, you are eligible to participate in this research. Do you consent? | <input type="radio"/> Yes <input type="radio"/> No |

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Part I.**Please rate the following questions.**

| | Strongly disagree | Disagree | Neither agree nor disagree (Neutral) | Agree | Strongly agree | Skip question |
|---|-----------------------|-----------------------|--------------------------------------|-----------------------|-----------------------|-----------------------|
| Solving problems in a group is an effective way to practice what I have learned. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Working in teams in class is productive and efficient. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Solving problems in groups leads to better decisions than solving problems alone. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Group decisions are often better than individual decisions. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| It is a waste of my time to work in groups. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Solving problems in a group is an effective way to learn. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Collaborating with my peers will help me in my career. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| The ability to collaborate with my peers will be necessary if I am to be successful as a student. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| In my career, I can be as successful working alone as working with others. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| The ability to work with my peers is a valuable skill. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Collaborating with my peers will help me be a better student. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I have a positive attitude about working with my peers. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Learning with other students will help me become a more effective member of a health care team | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Patients would ultimately benefit if health care students worked together to solve patient problems | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

| | | | | | | |
|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Shared learning with other health care students will increase my ability to understand clinical problems | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Learning with health care students before qualification would improve relationships after qualification | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Communication skills should be learned with other health care students | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Shared learning will help me to think positively about other professionals | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| For small group learning to work, students need to trust and respect each other | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Team-working skills are essential for all health care students to learn | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Shared learning will help me to understand my own limitations | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Part II.

Instructions: Please answer each statement below by selecting the choice that best reflects your degree of agreement or disagreement with that statement. Do not think too long about the exact meaning of the statements. Work quickly and try to answer as accurately as possible. There are no right or wrong answers.

| | Completel y disagree | Disagree | Somewha t disagree | Neutral | Somewha t agree | Agree | Completel y agree | Skip Question |
|--|-------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Expressing my emotions with words is not a problem for me | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I often find it difficult to see things from another person's viewpoint | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| On the whole, I'm a highly motivated person | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I usually find it difficult to regulate my emotions | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I generally don't find life enjoyable | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I can deal effectively with people | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I tend to change my mind frequently | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Many times, I can't figure out what emotion I'm feeling | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I feel that I have a number of good qualities | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I often find it difficult to stand up for my rights | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I'm usually able to influence the way other people feel | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| On the whole, I have a gloomy perspective on most things | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Those close to me often complain that I don't treat them right | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I often find it difficult to adjust my life according to the circumstances | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| On the whole, I'm able to deal with stress | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I often find it difficult to show my affection to those close to me | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

| | | | | | | | | |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| I'm normally able to "get into someone's shoes" and experience their emotions | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I normally find it difficult to keep myself motivated | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I'm usually able to find ways to control my emotions when I want to | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| On the whole, I'm pleased with my life | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I would describe myself as a good negotiator | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I tend to get involved in things I later wish I could get out of | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I often pause and think about my feelings | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I believe I'm full of personal strengths | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I tend to "back down" even if I know I'm right | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I don't seem to have any power at all over other people's feelings | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I generally believe that things will work out fine in my life | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I find it difficult to bond well even with those close to me | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Generally, I'm able to adapt to new environments | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Others admire me for being relaxed | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Part III.**Read each statement and select the response that best describes your capabilities.****Select the answer that BEST describes you AS YOU REALLY ARE (1=strongly disagree; 7=strongly agree)**

| | Strongly disagree | Disagree | Somewhat disagree | Neutral | Somewhat agree | Agree | Strongly agree | Skip Question |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| I enjoy interacting with people from different cultures | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I am confident that I can socialize with locals in a culture that is unfamiliar to me | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I am sure I can deal with the stresses of adjusting to a culture that is new to me | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I enjoy living in cultures that are unfamiliar to me | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I am confident that I can get accustomed to the shopping conditions in a different culture | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I know the legal and economic systems of other cultures | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I know the rules (e.g., vocabulary, grammar) of other languages | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I know the cultural values and religious beliefs of other cultures | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I know the marriage systems of other cultures | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I know the arts and crafts of other cultures | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I know the rules for expressing non-verbal behaviors in other cultures | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I am conscious of the cultural knowledge I use when interacting with people with different cultural backgrounds | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I adjust my cultural knowledge as I interact with people from a culture that is unfamiliar to me | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

| | | | | | | | | |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| I am conscious of the cultural knowledge I apply to cross-cultural interactions | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I check the accuracy of my cultural knowledge as I interact with people from different cultures | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I change my verbal behavior (e.g., accent, tone) when a cross-cultural interaction requires it | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I use pause and silence differently to suit different cross-cultural situation | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I vary the rate of my speaking when a cross-cultural situation requires it | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I change my non-verbal behavior when a cross-cultural situation requires it | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I alter my facial expressions when a cross-cultural interaction requires it | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Part IV.**Please indicate the extent to which you agree or disagree with each statement.****I see Myself as Someone Who...**

| | Disagree strongly | Disagree a little | Neither agree nor disagree | Agree a little | Agree strongly | Skip Question |
|---|-----------------------|-----------------------|-------------------------------|-----------------------|-----------------------|-----------------------|
| Is talkative | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Tends to find fault with others | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Does a thorough job | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Is depressed, blue | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Is original, comes up with new ideas | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Is reserved | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Is helpful and unselfish with others | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Can be somewhat careless | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Is relaxed, handles stress well | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Is curious about many different things | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Is full of energy | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Starts quarrels with others | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Is a reliable worker | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Can be tense | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Is ingenious, a deep thinker | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Generates a lot of enthusiasm | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Has a forgiving nature | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Tends to be disorganized | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Worries a lot | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Has an active imagination | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Tends to be quiet | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Is generally trusting | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Tends to be lazy | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Is emotionally stable, not easily upset | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Is inventive | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Has an assertive personality | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Can be cold and aloof | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Perseveres until the task is finished | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

| | | | | | | |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Can be moody | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Values artistic, aesthetic experiences | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Is sometimes shy, inhibited | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Is considerate and kind to almost everyone | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Does things efficiently | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Remains calm in tense situations | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Prefers work that is routine | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Is outgoing, sociable | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Is sometimes rude to others | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Makes plans and follows through with them | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Get's nervous easily | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Likes to reflect, play with ideas | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Has few artistic interests | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Likes to cooperate with others | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Is easily distracted | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Is sophisticated in art, music, or literature | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

A few questions to help me understand your social network.

Reflect upon your experience in the past 30 days. Please rate the following statements based on the degree to which you engaged in the stated activity.

| | Not at all | On occasion | Frequently | Skip questions |
|---|-----------------------|-----------------------|-----------------------|-----------------------|
| How often did you study with someone of a different race/ethnicity? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| How often did you study with someone of a different gender? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| How often did you discuss racial issues with someone of a different race/ethnicity? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| How often did you discuss gender-related issues with someone of a different gender? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| How often did you spend extra time learning more about someone of a different race/ethnicity? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| How often did you spend extra time learning more about issues facing someone of a different gender? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Which race/ethnicity best describes you? (Please choose only one.)

- ☐ American Indian or Alaska Native
- ☐ Asian / Pacific Islander
- ☐ Black or African American
- ☐ Hispanic
- ☐ White / Caucasian
- ☐ Multiple Race / Ethnicity
- ☐ Other
- ☐ Prefer not to respond

What is your gender?

- ☐ Male
- ☐ Female
- ☐ Other
- ☐ Prefer not to respond

If other chosen for Gender, please share?

What's your age as of today (whole numbers only)

Enter 150 if prefer not to respond

Has either of your biological parents or legal guardians completed a degree from a four-year college or university prior to you enrolling at VCU?

- ☐ Yes
- ☐ No
- ☐ Not sure
- ☐ Prefer not to respond

What is your current health profession career interest/major?

- ☐ Allied Health Professions (e.g. clinical lab sciences)
- ☐ Dentistry
- ☐ Medicine
- ☐ Nursing
- ☐ Pharmacy
- ☐ Other health care-related career interest
- ☐ Not interested in a health career
- ☐ Prefer not to respond

Incentives Preference

- ☐ Yes
- ☐ No

Do you wish to be included in the available incentives process?

Thank you for completing the survey! If you are among the first 150 to complete the survey, you will receive a \$10 eGift Card sent to your VCU email. The eGift Card will have a one-time, one-user limit.

All survey respondents will be enrolled in raffle to receive a \$100 VCU Bookstore credit. One winner will be selected randomly.

Please Note: The Survey and Evaluation Research Laboratory (SERL) is administering the survey and will utilize your VCU email only to provide you with the appropriate incentive. No contact information of yours is accessible to the researcher. Much success with your endeavors.

Sorry, you must be 18 years old or older to participate in this research. Thank you so much for your consideration of this survey. Much success to you in your future endeavors!

Sorry, you must be currently enrolled as a full-time student at VCU. Thanks for your consideration of this survey. Much success in your future endeavors!

Sorry, you must be either a Freshman or Sophomore to participate in this research. Thank you so much for your consideration of this survey. Much success to you in your future endeavors!

Sorry, only those students who have not yet enrolled in a degree granting health professions program can participate in this research. Thank you so much for your consideration of this survey. Much success to you in your future endeavors!

Thank you for completing the survey. Much success with your endeavors!

Thanks for considering the survey. Much success with your endeavors!

Appendix C: Recruitment Email Notification

Subject Line: Pre-health Student Survey

Greetings aspiring health professional.

A doctoral student at Virginia Commonwealth University is conducting a student survey to understand the relationship between emotional intelligence and cultural intelligence to team-based learning in pre-health students. Results of the survey will also be used to inform the work of pre-health advising offices in providing advisement and program resources to increase the success of pre-health students. Your honest and candid feedback is important to achieving the aims of this study.

As part of this study, you will be asked to complete one anonymous survey. The survey will take approximately 15-20 minutes to complete. Participants will be asked to answer questions regarding their attitudes towards team-based learning. Other areas of the survey will assess the students' level of emotional intelligence, cultural intelligence, and personality profile. Previous research suggests these personal characteristic is related to the development of team work and collaboration skills needed in today's health profession education and practice settings. The information is anonymous and no identifying information will be collected.

Participation is completely voluntary. The first 150 students to complete the survey can choose to accept a \$10 eGift Card for the taking the time to fill out the survey. Also, you can choose to enter a raffle for a \$100 credit to the VCU Barnes and Noble Bookstore. If you are interested in participating, please access the survey using the link provided in this email. If you choose not to participate, your status at VCU will not be affected in any way.

Please note you must be at least 18 years of age, currently enrolled in VCU, classified as a freshman or sophomore, and have an interest in a health profession career.

If you have any questions about this study, please contact the Kevin Harris at kaharris@vcu.edu or (804) 827-2087.

To access the survey, please use the following link: <https://redcap.vcu.edu/surveys/?s=H34C44KM9L>

If you do not wish to receive future emails regarding this research study, please reply to this email and change the subject line to state "Unsubscribe". This process may take up to 5 business days to process. Thank you in advance for your participation!

Kevin W. Allison, Ph.D.
Senior Assistant to the President
Office of the President
Interim Vice President for Inclusive Excellence
Virginia Commonwealth University
Email: kallison@vcu.edu
Phone: (804) 827-0027

Kevin A. Harris, M.S.A.
Associate Vice President for Academic Health Sciences
Office of the Vice President for Health Sciences
Virginia Commonwealth University
Email: kaharris@vcu.edu
Phone: (804) 827-2087

Appendix D: Institutional Review Board Approval Letter

2/9/2017

Virginia Commonwealth University Mail - Notification: IRB HM20008285 Allison - IRB Correspondence



Kevin A Harris <kaharris@vcu.edu>

Notification: IRB HM20008285 Allison - IRB Correspondence

1 message

IRBPANELA@vcu.edu <IRBPANELA@vcu.edu>
Reply-To: IRBPANELA@vcu.edu
To: kaharris@vcu.edu

Wed, Feb 8, 2017 at 4:23 PM



Office of Research and Innovation
Office of Research Subjects Protection
BioTechnology Research Park
800 East Leigh Street, Suite 3000
P.O. Box 980568
Richmond, Virginia 23298-0568

(804) 828-0868
Fax: (804) 827-1448

TO: Kevin Allison

CC: Kevin Harris

FROM: VCU IRB Panel A

RE: Kevin Allison ; IRB [HM20008285](#) Investigating the Relationship Between Emotional Intelligence and Cultural Intelligence to Attitudes Towards Team-Based Learning in Undergraduate Prehealth Profession Students

On 2/8/2017, the referenced research study *qualified for exemption* according to 45 CFR 46.101(b), category 2.

The information found in the electronic version of this study's smart form and uploaded documents now represents the currently approved study, documents, and HIPAA pathway (if applicable). You may access this information by clicking the Study Number above.

If you have any questions, please contact the Office of Research Subjects Protection (ORSP) or the IRB reviewer(s) assigned to this study.

The reviewer(s) assigned to your study will be listed in the History tab and on the study workspace. Click on their name to see their contact information.

Attachment – Conditions of Exempt Approval

Conditions of Exempt Approval:

In order to comply with federal regulations, industry standards, and the terms of this approval, the investigator must (as applicable):

1. Conduct the research as described in and required by the Protocol.
2. Provide non-English speaking patients with a translation of the approved Consent Form in the research participant's first language. The Panel must approve the translation.
3. The following changes to the protocol **must be** submitted to the IRB panel for review and approval before the changes are instituted. Changes that do not meet these criteria do not have to be submitted to the IRB. If there is a question about whether a change must be sent to the IRB please call the ORSP for clarification.

THESE CHANGES MUST BE SUBMITTED:

- Change in principal investigator
- Any change that increases the risk to the participant
- Addition of children, wards of the state, or prisoner participants
- Changes in survey or interview questions (addition or deletion of questions or wording) that change the level of risk or adds questions related to sexual activity, abuse, past or present illicit drug use, illegal activities, questions reasonably expected to provoke psychological anxiety, or would make participants vulnerable, or subject them to financial, psychological or medical risk

<https://mail.google.com/mail/u/0/?ui=2&ik=2ad524d0c0&view=pt&search=inbox&th=15a1f9c9da64cfc9&siml=15a1f9c9da64cfc9>

1/2

2/9/2017

Virginia Commonwealth University Mail - Notification: IRB HM20008285 Allison - IRB Correspondence

- Changes that change the category of exemption or add additional exemption categories
 - Changes that add procedures or activities not covered by the exempt category(ies) under which the study was originally determined to be exempt
 - Changes requiring additional participant identifiers that could impact the exempt category or determination
 - Change in inclusion dates for retrospective record reviews if the new date is after the original approval date for the exempt study. (ex: The approval date for the study is 9/24/10 and the original inclusion dates were 01/01/08-06/30/10. This could be changed to 01/01/06 to 09/24/10 but not to end on 09/25/10 or later.)
 - Addition of a new recruitment strategy
 - Increase in the planned compensation to participants
4. Monitor all problems (anticipated and unanticipated) associated with risk to research participants or others.
5. Report Unanticipated Problems (UPs), following the VCU IRB requirements and timelines detailed in [VCU IRB WPP VII-6](#).
6. Promptly report and/or respond to all inquiries by the VCU IRB concerning the conduct of the approved research when so requested.
7. The VCU IRBs operate under the regulatory authorities as described within:
- U.S. Department of Health and Human Services Title 45 CFR 46, Subparts A, B, C, and D (for all research, regardless of source of funding) and related guidance documents.
 - U.S. Food and Drug Administration Chapter I of Title 21 CFR 50 and 56 (for FDA regulated research only) and related guidance documents.
 - Commonwealth of Virginia Code of Virginia 32.1 Chapter 5.1 Human Research (for all research).

Appendix E: Hotelling's t-test Results

Hotelling's t-test Results for Emotional Intelligence Correlations

| r12 | r13 | r23 | t | df | p | Lower | Upper | alpha | Note |
|------|------|------|-------|-----|-------|-------|-------|-------|----------|
| .288 | .299 | .621 | -.220 | 272 | .826 | -.109 | .087 | .050 | VGWWBSC |
| .288 | .311 | .630 | -.467 | 272 | .641 | -.120 | .074 | .050 | VGWWBEM |
| .288 | .299 | .509 | -.194 | 272 | .846 | -.122 | .100 | .050 | VGWWBSO |
| .299 | .311 | .571 | -.227 | 272 | .821 | -.116 | .092 | .050 | VGWSCSEM |
| .299 | .299 | .494 | .000 | 272 | 1.000 | -.112 | .112 | .050 | VGWSCSO |
| .311 | .299 | .570 | .227 | 272 | .821 | -.092 | .116 | .050 | VGWEMSO |

Number of cases read: 6 Number of cases listed: 6

Hotelling's t-test Results for Cultural Intelligence Correlations

| | r12 | r13 | r23 | t | df | p | Lower | Upper | alpha | Note |
|----|------|------|------|-------|-----|------|-------|-------|-------|----------|
| | .311 | .201 | .541 | 1.989 | 272 | .048 | .001 | .218 | .050 | VGWMOTME |
| TA | | | | | | | | | | |
| | .311 | .143 | .383 | 2.615 | 272 | .009 | .041 | .293 | .050 | VGWMOTBE |
| V | | | | | | | | | | |
| | .201 | .143 | .608 | 1.102 | 272 | .271 | -.045 | .161 | .050 | VGWMETAB |
| EV | | | | | | | | | | |

Number of cases read: 3 Number of cases listed: 3

Vita

Kevin Alonzo Harris was born on October 2, 1966, in Emporia, Virginia. He graduated from Greensville County Senior High School, Emporia, Virginia in 1985. He earned a Bachelor's of Science in Computer Information Systems from Christopher Newport University in 1991, and a Master of Science in Administration from Central Michigan University in 2005.

Mr. Harris is currently the Associate Vice President for Academic Health Sciences, in the Office of the Vice President for Health Sciences at Virginia Commonwealth University (VCU). He is responsible for assisting the Vice President for Health Sciences on strategic and operational academic priorities, fostering student success, as well as leading diversity affairs and community engagement initiatives. Prior to this role, Mr. Harris served as Assistant Vice President for Student Initiatives and Inclusion, which entailed developing strategies and initiatives that increase diversity in VCU health sciences programs, fostering student success, and enhancing campus climate. Prior to his tenure at VCU, Mr. Harris was a Director in the Division of Diversity Policy and Programs at the Association of American Medical Colleges. His primary responsibility was as Deputy Director of the Robert Wood Johnson Foundation Summer Medical and Dental Education Program.

As a doctoral student, Mr. Harris is pursuing a Ph.D. in Public Policy and Administration in the L. Douglas Wilder School of Government and Public Affairs. His research focus is on understanding the implications of diversity in higher education as it intersects with interprofessional education.